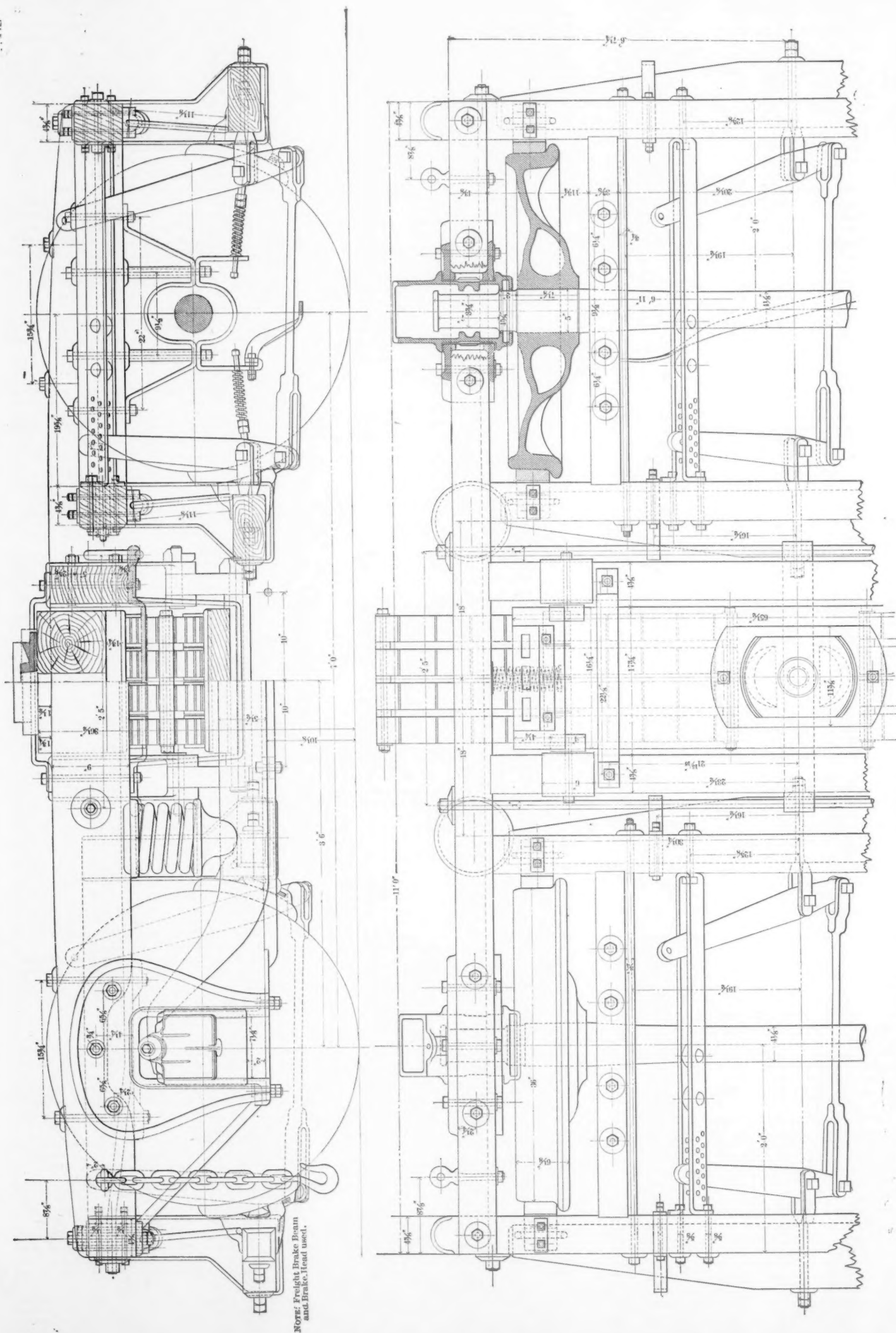




## NEWS OF THE WEEK.

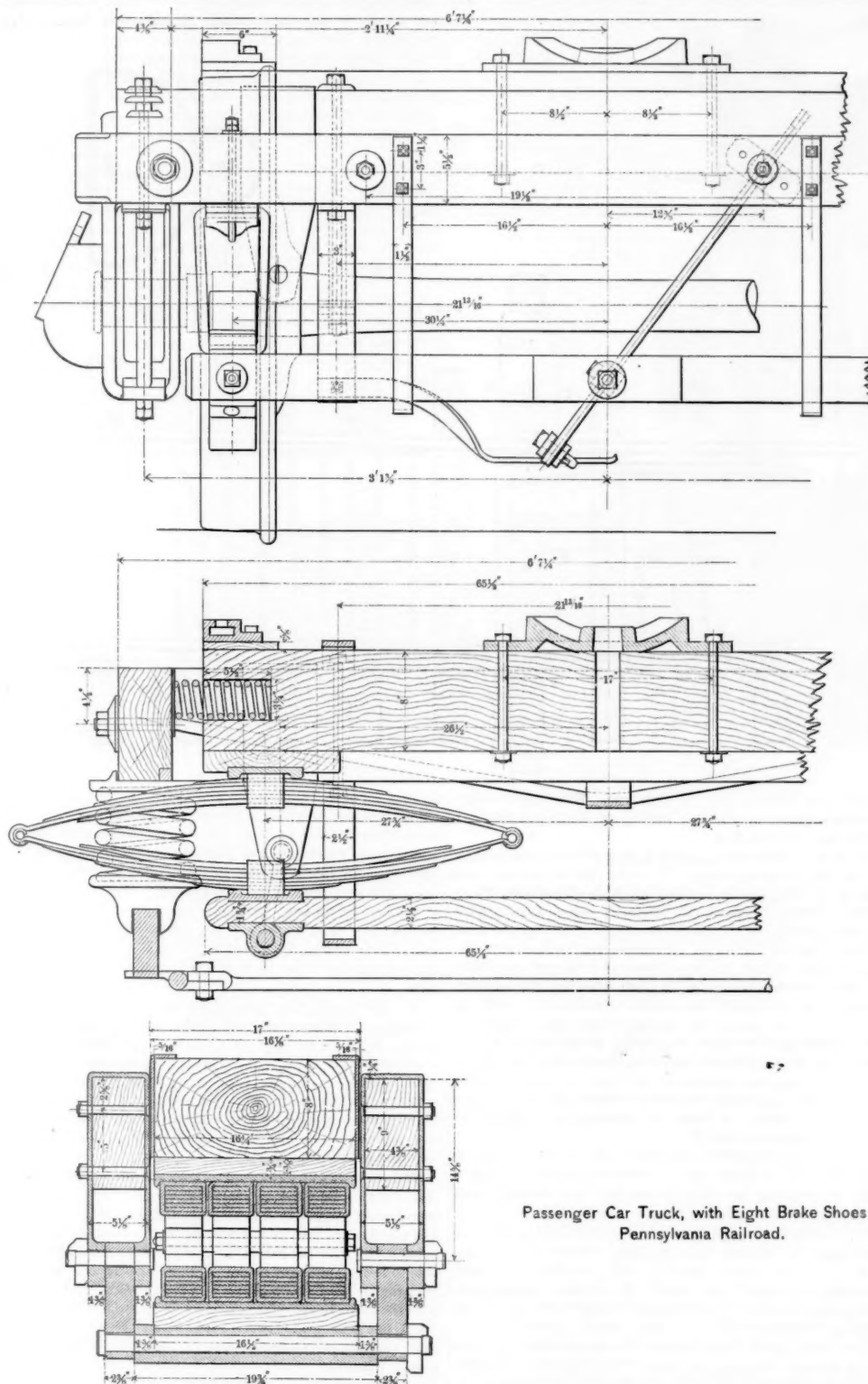
In the foregoing notes it has been said that in the 198 consecutive week days from April 2 to Nov. 18, inclusive, travel was laid at an average rate of 3.25 miles per day. As

The heavy additions to the annual expenditures are due to the item of railroad transportation. The total annual rate of cost of the entire transportation service, save that of foreign mails, was on July 1, \$3,973,329. In railroad transportation there was an additional employment of 7,011 miles of newly built roads lying mostly in the Western and Northwestern states. So rapid has been the expansion of business in those sections that the weight of mails for the quarter ending in March increased 16.03 per cent. over that of the preceding quarter. The prospect for the coming fiscal year is of an addition of perhaps 6,000 miles of railroad service. The star-route service has, after a rigid scrutiny, become much more efficient. Five postal railway clerks were killed by accident, 45 seriously and 72 slightly injured. T. Postmaster General urges again that the government ma-



PASSENGER CAR TRUCK, WITH EIGHT BRAKE SHOES—PENNSYLVANIA RAILROAD.





Passenger Car Truck, with Eight Brake Shoes—  
Pennsylvania Railroad.

provision for these servants who are seriously maimed or disabled. He dwells upon the importance of this class of the service and the need for the most efficient clerks. It is not difficult to imagine, he remarks, an interruption of the course of business on the trunk lines through an unlawful confederacy of the clerks—which has already been once attempted—that would result in general disaster to business interests. Therefore the highest class of help, physically, mentally and morally, is demanded for this service. They must be well paid, which is not now the case. Valuable clerks already in the service should not be disturbed. He continues: To secure fairly taught and suitable eligibles for original appointment it would appear a practicable course to provide the department with means for an annual or semi-annual examination in each of the states and territories. Information of the general subjects to which examinations would be directed, the ordinary duties of postal clerks, and as well of the qualities of personal and character requisite, might be readily furnished to all intending candidates to guide their preparatory work. Germany has wisely provided a school for instruction of persons in her postal service, in which a regular course of lectures is established. In the absence of such aids the proper preparatory course of study may be pointed out and profitably pursued by applicants and their proficiency be measured by examination, without fear of the abuse of mere superficial preparation. The scholastic requirements are simple and easily attainable. Careful scrutiny of the personal characteristics, physical, mental and moral, is of even superior necessity. The utility of some system of distinguishing the fit among the many seekers for such places is approved by all the experience of the service. All appointments have been habitually made for a probationary period of six months. Yet for years, indeed always, the proportion of failures has been very great—approximating one-fourth of all nominated. The discrimination should precede appointment so far as possible, and the mere pecuniary cost of it will thus be less. The department will be much aided in another way. Its postal car lines extend over 117,000 miles of railroad. The clerks ought, generally, for apparent reasons, to come from the region traversed, and should be fairly distributed along the respective lines.

The unsatisfactory state of the law for the employment and compensation of railroads for mail transportation is empha-

sized again as it has been for some years in each succeeding annual report. Among other things the present law is defective in omitting to grant authority to require and compel the service of railroads and attention is called to one road, the Old Colony, which has notified the department of its refusal to comply with the statute if the department does so by insisting on the provision of cars necessary to proper mail service; a condition which can only be temporized with until Congress shall have opportunity to consider what measures of legislation may be proper. In some cases compensation is inadequate but the aggregate effect is thought to be the imposition of an excessive charge on the treasury. The government should own its own postal-cars as in the case of buildings. Careful inquiry discloses that many of these cars, such as they are, would not cost to build \$3,000 each, that the best 50-ft. cars can be built for \$4,000 to \$4,500 each, a new 60-ft. car equal to the most complete and handsome now in the service for \$4,600; and that taking together all the post-office cars in the United States their average value does not probably exceed \$3,500. It appears that \$60 a month for the care of each car in use is an ample provision. An appended table shows that all the post-office cars in the service of the department number 432; of which but 342 are in ordinary use, and 90 are in reserve on different lines for contingencies. All these might be to-day purchased or their duplicates manufactured for \$1,600,000; add for cleaning, etc., \$720 a year each for 342 in use, \$246,240, the total is reached of but \$1,846,240. Yet simply for the use of these cars for the last year, including cleaning, etc., the department was under the annual rate of charge by the existing system of \$1,881,580, and the estimate deemed necessary to submit in prudent provision for the coming fiscal year, on the same basis, is \$2,000,000. In illustration, \$59,037 is annually paid on one line for the use of four cars that might be built and fully equipped in the best modern style for less than \$17,500. And this in addition to the full weight pay for transportation, amounting in the case mentioned to \$504,573. "Instead, then, of appropriating \$2,000,000 to rent the use of these cars for the coming year, why should not the appropriation be of a smaller sum to buy them, and of another, say \$250,000, for their keeping, the two together not aggregating the proposed rent? The department will thereafter gain at least \$1,500,000 per year, while sustaining

the cost of casualties." But whatever shall be attempted, says Mr. Vilas, it will be indispensable to exert the rightful prerogative of government and compel the railroads to accept and transport mails and mail clerks and inspectors at rates established by law. Great Britain did this as far back as 1838.

#### Passenger Truck with Eight Brake Shoes.

The accompanying engraving shows a method of applying the brake shoes to each side of the wheels of a passenger car truck. This style of brake rigging has been further fitted to some four-wheel passenger trucks on the Pennsylvania, and is now undergoing test. The truck shown has 38-in. wheels and 7-ft. wheel base, and measures 11 ft. over all.

The construction of the truck and the principal dimensions are very clearly shown on the engravings, and need little explanation.

In the ordinary method of applying the brake shoe pressure to one side only of the wheel, a considerable side strain is thrown on the journal brass, axle box and pedestal. When the brake shoe pressure is applied to both sides of the wheel in opposite directions, the strains on the journal, etc., are neutralized, and consequently the axle is not so liable to break and the wear of the various parts is largely diminished. This is especially true of the wear of the shoes. Assuming that the total brake shoe pressure remains constant, the resulting friction and wear is spread over eight shoes per truck, instead of four. Though the gross amount of iron ground away in a given mileage will probably be little altered, each of the eight shoes will probably run twice as long as each of the four shoes. This implies less frequent renewal of the brake shoes.

It is also estimated that a stop can be made in slightly shorter distance when the wheels are gripped on each side by brake shoes. When one shoe is used, the journal is forced against one side of the brass, and similarly any side play or slack between the brass and box, and box and pedestal has to be taken up before the brake shoe is applied to the wheel with full force. A small but appreciable fraction of time is thus consumed, and it is hardly necessary to point out that quick application is the most valuable and indispensable quality in a good brake.

#### Summary of the Inter-state Commerce Commission Report.

*General Introduction.*—No attempt is made to give statistics of United States railroad business. The few figures cited are taken from Poor's Manual.

The right to regulate commerce provided by the constitution was first applied to internal water routes in 1824. There was no Federal legislation for the control of roads; the United States authority was exercised entirely through the courts. It was almost entirely negative, declaring certain forms of state action unconstitutional. Thus its practical effect was to lessen rather than increase the possibility of government control of corporations by statute. Nor was the common law fully adequate for this purpose, because the circumstances of railroad business were so different from those contemplated by common law traditions. There was much doubt as to how far these traditions would apply. All this gave railroad managers power to make their own laws to a large extent. It gave room for arbitrary systems of special rates, often for wrong or corrupt purposes. It gave the opportunity for local discriminations, not perhaps equally flagrant, but almost equally disturbing to trade. There were other abuses which injured the railroad investors quite as much as the shippers, and which gave additional force to the demand for national regulation.

At the close of this introduction, a brief summary is given of the act to regulate commerce as finally passed. This is followed by more detailed analysis of some of the more doubtful points.

*I. Carriers Subject to its Jurisdiction.*—The act applies to carriers engaged in the transportation of passengers or property wholly by railroad or partly by railroad and partly by water when both are used under a common control for a continuous shipment. It does not embrace the carriers wholly by water, though they are engaged in the like commerce and are such business rivals of the carriers which it undertakes to control. Public attention had not been directed to the evils of discrimination in water carriage, and people thought of water routes chiefly as a controlling force to prevent arbitrary railroad action. Nevertheless these evils exist on water routes, and their existence makes it harder for the railroads to comply with the provisions of the act or for the Commission to enforce such compliance. The Commission suggests to Congress that the application of the act might perhaps be properly extended to carriers by water.

It has been difficult to say how far it was intended to apply to express companies. The Commissioners at first asserted that it did. Most of the companies were disposed to claim that it did not. The phraseology of the law seemed to support the claim of the companies, and there are some plausible arguments from history which point the same way. As the law now stands the Commission believes that it applies to express business when done by the railroad companies themselves, directly or indirectly, but not to such business when done by independent corporations. This is unfair and unequal. Congress should so change the law as either to include all express companies, or else to relieve those railroads which do their own express business from a burden under which their rivals do not suffer.

To some extent the same line of argument is applicable to sleeping-car companies, live stock carriage, private tank cars and other outside agencies more or less independent of the provisions of the act. Should the present state of things

continue it will favor a somewhat undesirable tendency to put business in the hands of outside organizations open to the same temptations as railroad managers and much less subject to control.

**II. Long and Short Haul Clause.**—The general provision is just; but the proposal to apply it without exception, as at one time contemplated in the house bill, would have produced very serious injury, in some cases irremediable. This was specially true in the territory of the Southern Railroad & Steamship Association, on account of the amount of water competition and the fact that many of the railroads could not exist under any system which would seriously reduce either their rates or their volume of business. Water competition, however, was not the only reason for exceptions to the short haul clause. Some were made on account of railroad competition; some as a means of developing new business. The arguments in favor of this practice were plausible, but outside the scope of the Commission's authority. Congress had passed a law and it was the duty of the Commission to give effect to the intent of Congress. There were two possible interpretations of the act. Some held that exceptions could only be made by special authority of the Commission; others laid stress on the phrase "under similar circumstances and conditions," and claimed that the railroads had the right to make exceptions for themselves whenever the circumstances and conditions were dissimilar. The Commissioners were from the first inclined toward the latter view, but, not daring to decide so important a question without the opportunity of hearing arguments, they made at the outset a provisional and temporary suspension of the act until its meaning could be more definitely decided. The final decision was given in the case of the Louisville & Nashville Railroad. It interpreted the act liberally, but practically cut off hope of relief or exception in most of those cases where the act as thus interpreted would come in conflict with railroad practice. To the act as thus interpreted railroad tariffs are gradually coming into conformity; while before the passage of the act few lines, operated as competitors for long haul traffic, could be found upon which the practice of the lesser charge for the longer haul did not exist. On a very large proportion of them all it has now come to an end—sometimes by raising rates on through traffic, sometimes by lowering them on local traffic, sometimes by a compromise between the two processes. The transcontinental roads have not conformed to the general rule, being affected both by water competition and by that of the Canadian railways. Cases are now pending which will involve a decision as to the legality of their course. Nor have the states south of the Ohio come into general conformity with this section, though some of them have greatly modified their tariffs in that direction.

The claim of a weak circuitous route that it must of necessity be exempted from the operation of the short haul clause, or else be crippled as an agency for doing business, is looked upon with disfavor, and as far as it causes direct violation of the act will not be made a ground for exception.

The operation of the law clearly does harm to distributing centres; depressing business of middlemen at such points and throwing larger direct trade into the hands of metropolitan dealers. The Commission simply states the fact, which involves a matter of legislative policy rather than judicial action, and refrains from comment upon it.

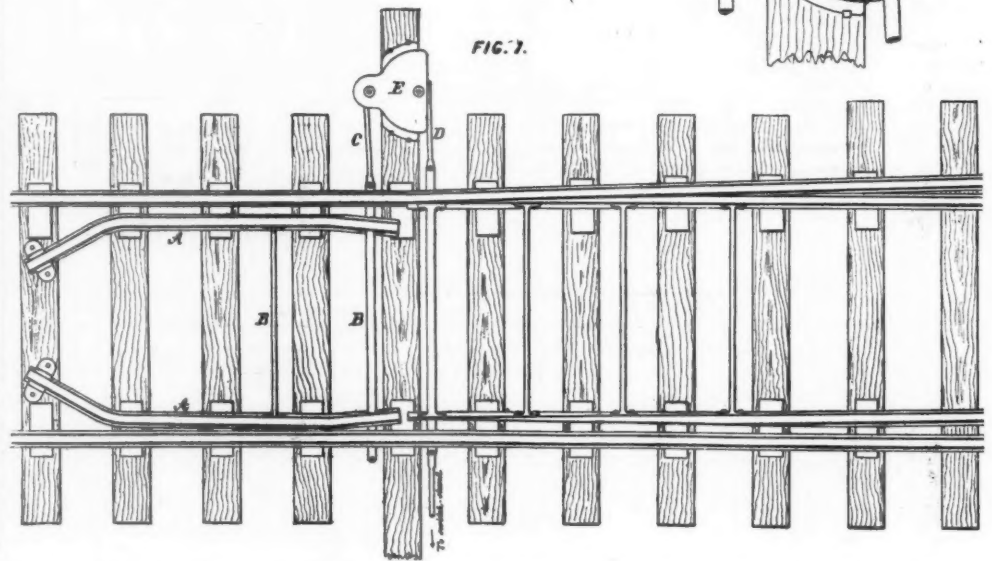
On the whole, the Commission believes that the effect of this section of the law has been good; that benefits will follow from making the rule as general as possible; and that even where it cannot be strictly applied, the conditions of long and short haul traffic being really dissimilar, the dissimilarity should be reduced to a minimum.

**III. Filing and Publication of Tariffs.**—Compliance with this provision has been good, though not in all cases quite satisfactory. The differences in form and method of preparation have nevertheless been so great that the Commission has found it impossible either to arrange the tariffs or to make any systematic investigation of their contents; nor are they likely to be able to do so unless the appropriation available for the purpose be decidedly increased.

**IV. General Supervision of Carriers.**—The Commission has been able to exercise this power to a large extent and is much gratified by the result. It finds that secret rebates have been practically done away with. No complaint has charged a specific act in violation of this provision; only one single exceptional instance has come to the notice of the Commission. All other cases examined went to show that the practice had been abandoned. Complaints of unjust discrimination under the open rates are still made, but the occasion for them has been greatly reduced since the railroad companies understand that they must be able to give at least a plausible defense of any such case if it is brought to the notice of the Commission.

**V., VI., VII. Complaints, Procedure, Expense of Hearings.**—It has been the effort of the Commission to make action under the law as informal and inexpensive as possible. In no case has the Commission declined to give attention to a complaint because of its being informally or imperfectly presented, but, when not in shape for its action, if the facts indicated a probable grievance, it has opened correspondence with the carrier with a view to redress. In the majority of cases this has resulted in satisfactory arrangements. Either the complainant has been found to be mistaken in his facts, or there has been a mistake of an agent which the carrier readily corrected; or when there was a real difference, the parties succeeded in making amicable settlement. When litigation was really necessary, technicalities have been discarded as far as possible. Demurrers or motions to dismiss have not been favored, unless the case was such that the whole merits would thereby be presented. The defendant has been expected to disclose its defense by answer

MANSFIELD'S GUARD FOR SPLIT SWITCHES.



so that one hearing may be sufficient. When parties have managed their own cases the taking of testimony has been somewhat informal also.

Witnesses produced by parties apparently are to be paid by the parties producing them. To avoid this burden the Commission has held special sessions in other places than Washington. That is particularly necessary when a railroad is the nominal defendant, but where the case really affects most seriously certain classes of customers who would suffer in the proposed change. In such cases it is almost absolutely necessary to hear the case at a point where all the different interests can be properly represented without undue expense.

In none of the cases so far decided by the Commission has it felt called upon to order reparation to be made for past injury. In the majority of instances there was no reason for any such order, the complaints affecting the future rather than the past; and in any event the wisdom, if not the right, of the Commission in trying to enforce such reparation would be somewhat doubtful.

**VIII. Annual Reports.**—The date fixed for this purpose is June 30, and it is hoped that a form may be devised which shall be concise and as nearly as possible in conformity with the best forms now required by state laws.

**IX. Classification.**—Regret is expressed at the absence of uniformity in railroad classification. Such classification should, of course, not be based on cost of service, but must primarily be based upon value. In a value classification each section has its own necessities. Each railroad, for its own sake, desires to meet the needs of the section which it serves. Any joint classification is a compromise; any one which extends over large sections of the country, a whole system of compromises. It is probable that the results obtained in this way are quite as fair as any which could be secured by the direct action of the Commission. In such cases as are brought before its notice, it will keep the general object of uniformity in view.

The classification of passengers has been a subject of much complaint. This question is complicated by a lack of jurisdiction over sleeping car companies under the act. On the whole, the tendency of the Commissioners' decisions has been against special rates for classes of persons, like commercial travelers or settlers.

**X. Traffic Associations.**—The reasons which made these associations desirable are stated with clearness. Consolidation was looked upon by the public with distrust. Absolute independence on the part of the different lines involved great inconvenience; and associations for joint tariffs, running arrangements, interchange of cars, etc., became a matter of public convenience as well as of good railroad economy.

It was one important object of such associations to prevent wars of rates. Mere agreement was not enough. Pooling seemed necessary, and was carried out with some success. It was distrusted by the public, because it was thought that it would keep railroad rates high. Such was not the effect. The pooling system has done much to maintain steadiness in rates, but the managers have not been able by means of it

to keep rates up to former standards. It has done something, however, to check a prevailing tendency to consolidation. The motives to consolidation are diminished by any contrivance which removes obstacles to the interchange of business, and increases the facilities and conveniences for uninterrupted commercial intercourse. Pooling has been prohibited by the act. But the other object for which traffic associations exist have not been prohibited, and it is desirable for the public as well as the railroads that these associations should continue their activity in all legitimate directions.

**XI. Reasonable Charges.**—The Commission believes in the principle of charging what the traffic will bear, properly applied. We have not space to give even a summary of their analysis on this point, which covers ground already familiar to our readers. We can only quote from their concluding sentence in this section. "The question of rates is often quite as much a question between rival interests and localities as between the railroads and any one or more of such localities or interests."

**XII. General Observations.**—The Commission feels justified in saying that the operation of the act has in general been beneficial both to the railroads and to the general public. The abolition of rebates has worked well for all parties. By doing away with the passes the Northwestern roads have been able to lower passenger rates. Freight traffic has been exceptionally large in volume. Classification has tended toward uniformity. The tendency of rates has been downward, but without destructive rate wars. No very considerable changes are recommended in the law. Express companies should be clearly named or clearly excluded. Provisions against sudden raising of rates should be made more distinctly applicable to joint rates. The Commission should have fuller powers to enforce uniformity in publishing rates and in collecting the matter brought before the Commission. The question whether the act should be extended to water carriers is submitted to Congress without recommendation, but with an obvious leaning in favor of the change.

#### Movable Guard Rails for Split Switches.

Heretofore it has apparently been uncertain whether the facing points of split-switches should or should not be provided with guards. There is no general practice in this matter, some railroads placing two eight-foot guard rails just before the point of the switch, some one guard-rail before one rail of the switch, and many dispensing with switch-guards altogether.

The office of a guard-rail is to protect some dangerous or questionable point on the opposite rail of the track from that adjacent to the guard, as for instance, the point of a frog, which but for the frog guard-rail would be a dangerous point in the track.

The use of two fixed guard-rails before a switch is of little effect, for any pair of wheels which can pass a frog would not be apt to interfere with the open rail of any ordinary



Adjustable Tire Shrinkage Gauge.

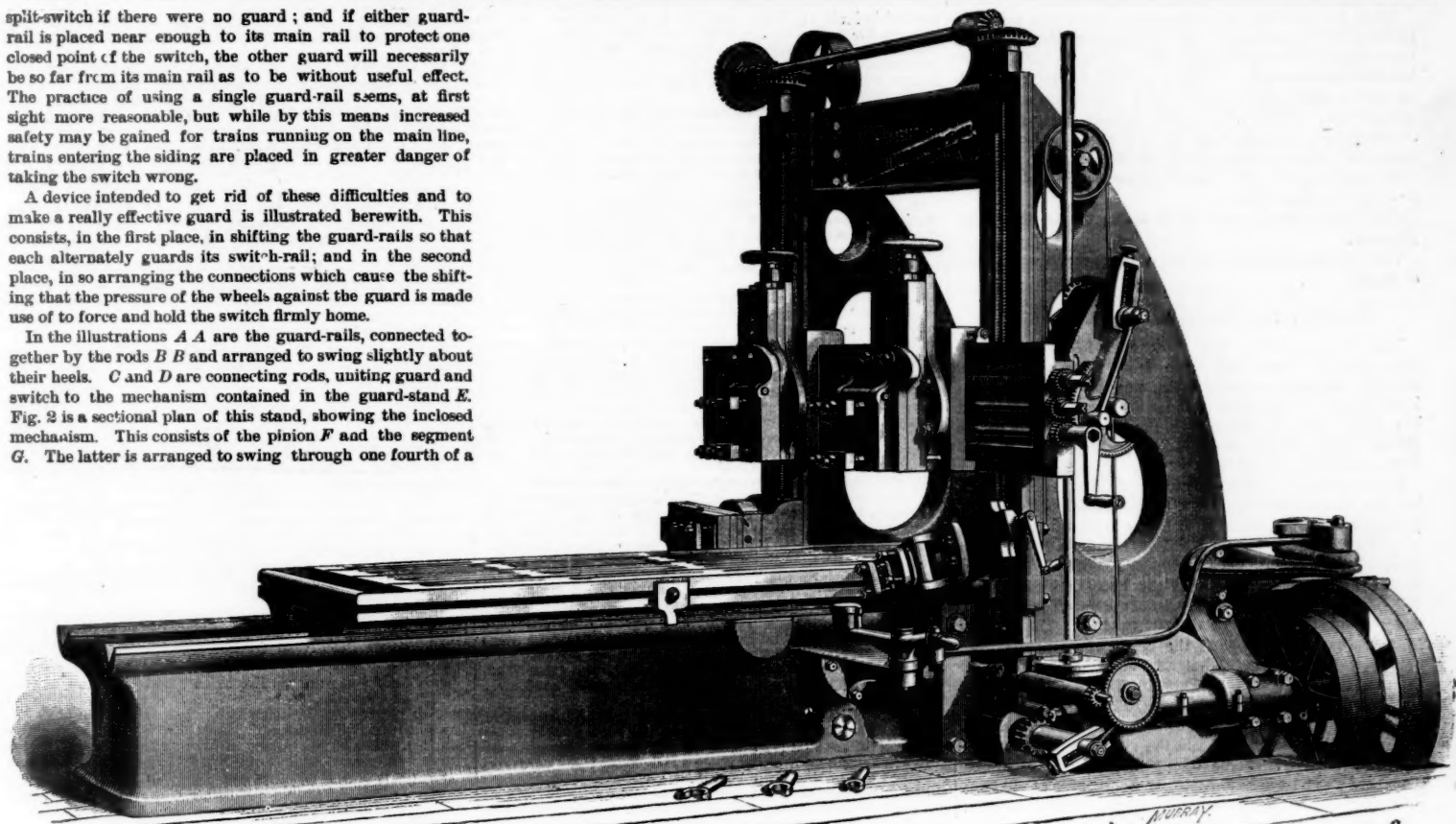
Made by MESSRS. PEDRICK & AYER, Philadelphia.



split-switch if there were no guard; and if either guard-rail is placed near enough to its main rail to protect one closed point of the switch, the other guard will necessarily be so far from its main rail as to be without useful effect. The practice of using a single guard-rail seems, at first sight more reasonable, but while by this means increased safety may be gained for trains running on the main line, trains entering the siding are placed in greater danger of taking the switch wrong.

A device intended to get rid of these difficulties and to make a really effective guard is illustrated herewith. This consists, in the first place, in shifting the guard-rails so that each alternately guards its switch-rail; and in the second place, in so arranging the connections which cause the shifting that the pressure of the wheels against the guard is made use of to force and hold the switch firmly home.

In the illustrations *A A* are the guard-rails, connected together by the rods *B B* and arranged to swing slightly about their heels. *C* and *D* are connecting rods, uniting guard and switch to the mechanism contained in the guard-stand *E*. Fig. 2 is a sectional plan of this stand, showing the inclosed mechanism. This consists of the pinion *F* and the segment *G*. The latter is arranged to swing through one fourth of a



IMPROVED PLANING MACHINE.

Made by BEMENT, MILES &amp; Co., Philadelphia.

## Planing Machine.

revolution, by virtue of its connection to the switch, while the pinion is driven by the segments through three-fourths of a revolution. This has the effect to carry the guard connection well past the dead-centre in each position. This is done in order that a pushing or a pulling force acting on the guard connecting-rod *C*, shall be converted into a force acting in the same direction on the rod *D*. In this way the pressure of the wheels against the guard becomes pressure of switch against its main rail, and the apparatus is a safeguard in a double sense, in that the wheels are drawn away from contact with the switch-point, while at the same time the switch-point is forced away from the wheels.

The extreme movement of the guard is  $2\frac{1}{4}$  in., about half that of the switch; the least distance of guard from main rail is  $1\frac{1}{2}$  in.; the pinion and segment are made of malleable iron.

For further particulars address A. K. Mansfield & Co., 280 Broadway, New York, who have a patent pending for this device.

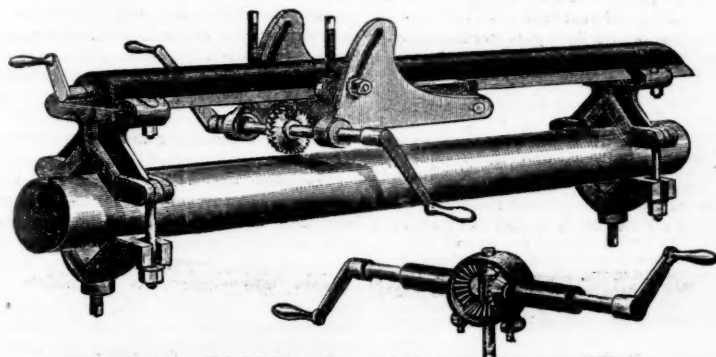
## Adjustable Tire-shrinkage Gauge.

The accompanying engraving represents a useful gauge for turning wheels, boring tires, etc. The gauge is adjustable, and movable pieces are inserted in order that proper allowance may be made for shrinkage. The first movable piece *A* is about 1 in. long and is clearly shown in the engraving. The gauge is set to the diameter of wheel centre with this block in its place. It is then replaced by the second or allowance block, which is made shorter than the first by a distance exactly equal to the amount of shrinkage which it is desired to allow in the tire.

The gauges are ground up to a micrometer calipers, and as the points are adjustable any inaccuracy arising from wear can be adjusted.

Each gauge can be provided with several movable pieces or allowance blocks adjusted to a variety of diameters and allowances for shrinkage.

Any further particulars concerning this gauge can be obtained of Messrs. Pedrick & Ayer, Philadelphia.



Portable Key-Seating Machine

Made by MESSRS. PEDRICK &amp; AYER, Philadelphia.

During the past five years our leading tool builders have been giving much attention to improvements in planing machines, whereby their convenience and efficiency might be enhanced. No firm has perhaps made greater efforts in this direction than Messrs. Bement, Miles & Co., Philadelphia, whose latest improved machine we illustrate in the accompanying illustration, which represents their larger planing machines from 4 ft. square upwards. The width and height of these planers are such as to easily admit pieces slightly larger than the nominal capacity of the machine, to allow for finishing.

The machine is shown with two cutting heads upon the cross-slide and one upon each upright, so that four cutting tools may be used, and the driving power is amply sufficient to allow of heavy cuts being taken with all four heads at once. The feeding motions of these heads are entirely independent, so that they can be operated towards or away from each other, or all in the same direction, as may be required. They are also arranged to take very wide finishing cuts in all directions automatically. They are operated from the driving gear at either end of the cut, and are automatically disconnected from the same when not actually in operation, so that no power is consumed except while in the act of feeding. Their action is perfectly noiseless, and all their adjustments are conveniently controlled from the usual position of the operator.

The whole arrangement for the cross-slide feeds is carried upon the crosshead itself, so that in planing high work, the operator can adjust his feeds, apply them or release them, at the top of the machine without being obliged to get down and back again.

The reversing feed pawls of the cross-slide are moved by thumb latches projecting from the ends of the cross-shaft and screws, which places them in the most convenient position for rapid and accurate manipulation.

The driving gear is so arranged that the machine stands parallel with the line shafting. All the gears are accurately cut from the solid, and many of them are made of steel.

The belts are managed by a simple and effective shifter,

by which the motions of the table may be controlled perfectly by hand, when desired, stopped, started or reversed instantly from either side of the machine, without using the countershaft belt shifter.

The tool aprons are set over so as to allow the tools to be brought very near each other for planing portions of surfaces which are close together.

The cross-slide is of such length that when one head is at either end, the other head will cut over the entire width between the uprights. This requisite, which is frequently neglected, is very important for finishing wide pieces correctly.

The double webbed construction of the uprights gives them unusual stiffness, and is especially advantageous when side heads are used, which is now fast becoming universal to the best practice. The entire broad front of the uprights is utilized for the support of side heads, which are also counter-balanced. They have automatic vertical feeds to the full capacity of the machine, and are provided with swivels for angular planing, as shown in the cut.

The cross-slide is raised and lowered by power.

The bed is thoroughly strengthened and reinforced in the centre of its length, where the uprights are attached, and where the greatest strains of the cuts are taken.

The V's have broad surfaces and are effectually lubricated by a very simple and effective device, which has been patented, consisting of rollers inclosed in oil pockets.

By a peculiar arrangement of the driving gear, the table is made to return easily and smoothly at a speed of from 70 to 100 ft. per minute, and to shift noiselessly and without jar. This quick return movement has been the subject of much study and experiment, as it is a great labor and time saver. By a careful adjustment of the parts and the correct movement of the belt-shifter, this desirable result has finally been obtained without any additional moving parts in the gearing and without any buffers or cushions.

## Portable Key-seating Machine.

The accompanying engraving represents a machine recently introduced by Messrs. Pedrick & Ayer, of Philadelphia. The portable key seater is useful where large shafts are used, as it saves handling the shaft, as the machine can be driven in almost any position, and can be attached to any shaft from  $1\frac{1}{2}$  to 6 in. dia.

The construction and operation of the machine will be understood from the accompanying engraving, which shows a small size machine actuated by a screw and driven by hand. In the larger machines worm gearing is used, and the driving power can be obtained from the nearest shafting by means of round belts in the same manner as portable drilling machines. The brackets are placed in alignment with the slide beam, making the machine self-setting. They are secured to the beam by bevel headed bolts, tightened with a nut, as shown in the engraving.

The cutter shaft is carried by frames swinging on pivots. These frames can be clamped in place by bolts in the segmental slots. In order to sink the cutter into the work, the clamping bolts are slackened, and the cutter frame is depressed by two screws provided for that purpose. When the proper depth is reached, the clamping bolts are again tightened.

Spiral cutters are used, and are secured to the cutter spindle in the ordinary method by nuts, collars and key.



When the machine is used under a locomotive to cut the key slots for the eccentrics, the arrangement shown in the lower figure of the engraving is used. A steel yoke with two trunnion bearings and carrying a vertical spindle with a cutter drill is substituted for the cutter spindle shown in the upper figure. The trunnions of the yoke fit the bearings in the swinging frame; this attachment is driven by three mitre gears and cranks on either side of machine.

The spindle can be kept vertical by means of an adjustment provided for that purpose.

Slots of any length can be cut by sliding the machine along the shaft.

The carriage can be used on end of beam to cut slots in end of shafts.

#### The New York Central's Vestibule Train.

Last Wednesday the New York Central & Hudson River ran a special "vestibule" train from the Grand Central station to Albany and back, to exhibit to an invited party of railroad men and members of the press the new cars built for the New York & Chicago limited trains. There were present on the train about 160 guests, including railroad officers representing roads in all parts of the country.

The train was composed of six cars, one buffet car, one dining car, two sleepers and two parlor cars. These cars are part of a lot of 55 similar ones now building by the Wagner Company for the Vanderbilt lines. They will be put in regular service between New York and Chicago Dec. 15. These cars certainly are most creditable to the taste and skill of the Wagner Company and the enterprise of the New York Central. They are beautifully finished and fitted up. The interior is finished in mahogany, and the brass work, tapestry and upholstery is all of tasteful designs. The brass work is by the Dayton Manufacturing Co. They are lighted with oil lamps, and heated by the Safety Car Heating & Lighting Co.'s system of hot water circulation. The day was warm and there was no severe test of the heating, but the system seemed to work quite satisfactorily. Some disappointment was expressed that there was no opportunity to see the working of the Martin system now in use on many of the trains of the company.

The cars are equipped with the Miller hook and Cowell platform.

The "buffet" car has an unobtrusive bar, and the proper antidotes are carried in a medicine chest in the same car. These, however, are very inconspicuous features. There are also a barber shop and bath-room, a reading and smoking-room, with all the best periodical publications, and a well selected library of some 300 volumes. A printed list of the books is distributed through the train, and a porter will bring to passengers such volumes as they may select. There are some innovations even in the catalogue of the library. One finds, for instance, the works of Charles Waldo Emerson and Ralph Waldo Irving; "The Dynamiter" and "Kidnapped," by Edward Ireneus Stevenson; "Pour Ogle Moga," by D. D. Lloyd, and other pleasant surprises. These, however, are but trifling spots on the sun.

#### Examination of Trainmen on the Chicago, Burlington & Northern.

This road has recently had some extensive catechetical examinations of its conductors, enginemen, brakemen and train-dispatchers for the purpose of testing their knowledge of the train rules. From the extensive list of questions prepared for this examination, we give herewith some copious extracts, which will be of interest to officers who use or contemplate using a similar plan. The questions and answers here shown are taken from a list which contains about twice as many as we have printed. Some comment will be found in the editorial columns.

Question 1.—What do the letters A, B, C and D signify when placed opposite the numbers of a train on the time card? Answer.—A, daily; B, daily except Sunday; C, daily except Saturday, and D daily except Monday.

Q. 2.—What do full-faced figures show on the time card? A. The meeting or passing points of trains.

Q. 3.—When an engine or train is run without a conductor or a train breaks apart, leaving the forward part of the train without a conductor, whose place is it to assume a conductor's duties? A. The engineer's.

Q. 4.—When arriving at a station, what are the conductor's and engineer's duties in order to get out of the station promptly? A. Good judgment and strict attention to business on the part of the engineer and conductor.

Q. 11.—If your train slows down or stops for any cause between stations, what action must be taken as a flagman to protect your train? A. As soon as it is safe for me, I will get off, taking the proper danger signals and go back, placing one torpedo on the rail on engineer's side ten telegraph poles distant from the rear end of train, then proceed to the twentieth telegraph pole distant from the rear end of train, and place another torpedo on the rail on the engineer's side. If the view is clear for one-fourth of a mile in the rear, I will remain at this point. But if the view is not clear so that I cannot see one-fourth of a mile in the rear, I will go back to a point where I can see or be seen one-fourth of a mile in the rear and place one torpedo on the rail on the engineer's side, then retrace my steps one telegraph pole and remain at this point until an expected train arrives or I am called in by the engineer of my train. If the expected train arrives, I will flag them to stop with my danger signals. After the train has stopped, if the train is a freight, I will tell the engineer and fireman, if a passenger, I will tell the engineer and conductor the cause of my flagging them. After stopping and notifying the train, I will retrace my steps, taking up all the torpedoes. But if I am called in by engineer of train before the arrival of the expected train, I will place another torpedo on the rail on the engineer's side, 50 ft. from the last one put down. Then retrace my steps to my train taking up all the rest of the torpedoes. As an extra precaution in stormy or foggy weather, a flagman on getting off his train to go back to flag must place one torpedo on the rail on the engineer's side as soon as he gets off and go back as quickly as he can, placing torpedoes on the rail on the engineer's side at intervals of ten telegraph poles. If he can get that far before a train approaches him, if he cannot get the full distance pre-

scribed in Rule 14, Time Card No. 8, he must place one torpedo on the rail on the engineer's side before the train drives him off the track after he has flagged it. Flagmen on passenger trains will alight from the rear end of train with proper danger signals every time the train stops, whether at or between stations.

Q. 18.—When torpedoes have been left on rail to warn following train, what is conductor's duty? A. It is conductor's duty to notify train dispatcher from first telegraph station between what points he left torpedoes that he may notify trains to run regardless of them, also to leave written notice with operator for opposing trains.

Q. 20.—What are the duties of conductor and engineer on meeting a passenger train at a station that is receiving or discharging passengers? A. They must run slowly and with great caution, and when standing at a station must open their train to allow free passage way for all persons going to and from the passenger train.

Q. 22.—What are the duties of all trains on approaching all stations? A. To proceed cautiously, expecting to find the main track occupied.

Q. 27.—What action should be taken by the engineer when he discovers that his train has parted? A. The engineer must sound the "Break in two whistle" and great care should be taken to keep the forward part out of the way of the detached part, and every precaution taken to prevent a collision.

Q. 28.—What are the duties of conductor and rear brakeman when they discover that the train has parted? A. To stop the rear portion of the train without waiting for any signal from the engine.

Q. 29.—After the engineer has stopped the forward part of the train, what is his duty? A. The engineer must send his brakeman back to make an examination of the rear end of his portion of the train to see that no draw bars are hanging down to interfere with the moving of his portion of the train.

Q. 30.—After deciding to move the forward part of the train back toward the rear part, how should the engineer handle the forward part of the train? A. He should place the fireman on the rear car of the forward part of the train with a white light in the night time to act as signal man and brakeman, and send his brakeman with red and white lanterns at night the proper distance, to be governed by condition of track, not less than twenty telegraph poles in advance of the forward part as flagman, then move cautiously back.

Q. 31.—What action must be taken by the conductor after stopping the rear portion of his train? A. He must go to the head end of the rear portion of his train to see that no draw bars are hanging down and place a red light, if at night, on the front end of the head car, then go the proper distance ahead of the rear part to warn the forward part returning of the position of the rear part of the train. An exception of the above rules shall be when the whole occurrence is in plain sight. The conductor and engineer will then use their best judgment in recoupling.

Q. 32.—If you should find the rear part of a train that has parted standing between the switches at a station, what would you do? A. I would wait indefinitely for the forward part to return unless otherwise moved by the train dispatcher.

Q. 33.—What action should be taken by train dispatcher in order to run you around the rear portion of a parted train. A. The dispatcher must hold the forward part of a parted train at the next station and the engineer in charge of the forward part must wire message to the dispatcher giving the initials and number of rear car of forward part of train also condition of draw bar.

Q. 34.—After dispatcher receives this information from the engineer in charge of the forward part of the parted train, what action must be taken by him? A. The dispatcher will get the conductor of the rear part of the parted train and wire him the initial and number of the rear car of the forward part of the train.

Q. 35.—What action must then be taken by the conductor of the train that has parted? A. The conductor must go to the head end of the rear part of his train and get the initial and number of the head car, also condition of draw-bar, then by comparing the initials and number of the rear car of the forward part of his train and the head car on the rear part of his train with his train book he will know whether the track is clear or not between the forward part and the rear part of his train and will wire message to the dispatcher and advise him that the track is clear or not clear, and if the track is clear the dispatcher can, by holding the forward part of the parted train at the next station run a train around the rear portion of the parted train.

Q. 36.—If you find the rear portion of a train that has parted stopped between stations, what may be done? A. If it can be done safely, it may be moved forward under the protection of a flagman; special caution being used to guard against finding a middle portion of the train unprotected, or the forward part returning. In all cases the engineer should return after the rear portion of the train unless otherwise ordered by the train dispatcher.

Q. 37.—In case of a wreck, who shall take charge of the same? A. In absence of the superintendent or any official entitled to take charge and who actually does take charge the conductor shall take charge of a wreck.

#### QUESTIONS ON TELEGRAPHIC ORDERS.

Q. 11.—In case you had an order to run to a certain station with orders to (there) call in a work train, how long would you wait before going after calling them in? A. Until work train came in or my order was recalled by the train dispatcher.

Q. 12.—Providing you had an order to meet a work train at a certain point, and you should meet a flagman of the work train at a station before reaching the point that your order gave you to meet, what would you do? A. I would stop.

Q. 13.—If you were running a regular train and should receive an order to leave a given station ahead of time, what rights would you have against opposing trains? A. None whatever.

Q. 18.—If you were on No. 14 at Prairie du Chien and receive an order as follows: "Opr. Prairie du Chien, hold No. 14 for orders," and should afterward receive an order as follows: "Opr. Prairie du Chien, No. 14 and No. 13 will meet at Prairie du Chien," would you go on the arrival of No. 13? A. No, sir.

Q. 19.—What kind of an order would you require to get out of Prairie du Chien? A. I would want either an order addressed to the operator at Prairie du Chien recalling his order to hold No. 14 for orders, or an order addressed to C. & E. No. 14, Prairie du Chien, that affected their train.

Q. 21.—If you were on No. 20 at Bagley and should receive an order as follows: "No. 20 and No. 19 will meet at Glen Haven," and on your arrival at Glen Haven found first section No. 19 there instead of No. 19, what would you do? A. I would consider that I held improper orders, and would go to the telegraph office and have my order recalled, and get an order that No. 20 and first section No. 19 will meet at Glen Haven.

Q. 22.—If you were on a work train and should receive an order as follows: "No. 20 will run one hour late between E. Dubuque and Savanna." What rights would such an order give you ahead of or against No. 20 between East Dubuque

and Savanna? A. It would give me 50 minutes to make East Dubuque or any intermediate station ahead of or against No. 20.

Q. 23.—Why would it only give you 50 minutes of their time to make any intermediate station ahead of or against No. 20? A. Because Rule 59, Time Card 8, requires me to be on side track and clear the time of the regular train at least 10 minutes before the time specified on the order.

Q. 24.—If you were on No. 20 and should receive an order as follows: "No. 20 will run one hour late between East Dubuque and Savanna," How late would you run? A. One hour and five minutes.

Q. 25.—Why would you run one hour and five minutes? A. Because Rule 56, Time Card 8, requires me to run not less than five minutes more behind time specified in the order.

Q. 27.—Upon your arrival at a station where a train order signal is displayed and you should receive an order not affecting your train with or without an OK, and there should be no orders addressed to you, what should you do? A. Would go ahead.

Q. 36.—If you have an order to run to Cassville regardless of No. 14, does it give you any rights over any other train? A. No, sir.

Q. 37.—If later on, you should receive an order making a meeting point between No. 13 and No. 14 at Hay, would you accept it as a proper order? A. Yes, sir.

Q. 38.—What would be the effect of this meeting order? A. It would virtually cancel the regardless order, and require both trains named to run to and meet at Hay.

Q. 46.—Is an order to be considered complete under any circumstances before the conductors' or engineers' "13" has been given and the OK indorsement received? A. If, after the operator has signed the order and repeated it and received his OK to the same, the line should cease to work, then conductors and engineers will sign it and accept it as a complete order and observe it.

Q. 47.—Should the line cease to work before the operator has repeated the order and received his OK to the same, How should it be treated? A. It should be treated as of no effect whatever.

Q. 55.—If you were on No. 19 and had an order to meet No. 20 at Cassville, if before No. 20 arrived at Cassville they should become 12 hours late, what would you do? A. I would wait five minutes for variation of watches and proceed regardless of No. 20 and of my meeting order. I would run carefully expecting to find No. 20 flagging against me.

Q. 56.—If you were on No. 20 and had an order to meet No. 19 at Cassville, and before arriving at Cassville you should become 12 hours late, what would you do? A. I would consider that I had ceased to exist as No. 20 and my meeting order was void. I would flag myself to the first telegraph office and call for orders.

#### QUESTIONS FOR TRAIN DISPATCHERS.

Q. 10.—When a wild train calls for orders at a terminal point or junction point what is your first duty? A. To make meeting points between it and all approaching wild trains, and any overdue regular train we desire to move it against.

Q. 11.—When a wild train calls for an order to run over any portion of the road, how do you ascertain what opposing wild trains may be on the road. A. By carefully examining the train sheet and order-book.

#### TO OPERATORS.

Q. 9.—Should the wire fail before you have repeated an order and received the O. K., how does it affect the order? A. The order is void, and must be so considered by all concerned. The signal will remain displayed until the order has been shown to the person addressed, when it will be taken in to allow him to proceed, using a copy of the order marked "void" as a clearance.

Q. 16.—After acknowledging the receipt of a train order, what is the extent of your responsibility in regard to the proper delivery of the same. A. I would consider myself personally responsible for the holding of the train and the proper delivery of the order and so regard it in the fullest possible sense.

Q. 17.—Providing your operating table was so situated that your train order signal could not be seen while sitting at your instrument, what would be your duty. A. It would be my duty to personally know that the light or flag was properly displayed, and that it was not disturbed until its full purpose was accomplished.

Q. 18.—Providing your train order signal should go out after receiving orders for an expected train, or it should be stormy or foggy weather so that the signal could not be distinctly seen, what action would be necessary for you to take to stop the expected train. A. It would be necessary for me to keep a lighted lantern and torpedoes on hand to use, viz., put torpedoes on the rail and flag the train personally.

#### Convention of Accounting Officers.

The general convention of accounting officers called to consider the question of agreeing upon some uniform method of settling joint accounts of freight billed through, was held at the Grand Pacific Hotel, Chicago, Dec. 7. Representatives of 76 roads were present. John T. Denniston, Auditor of the Union Line, presided, and C. Kelsey, of the Chicago & Alton, acted as Secretary.

The following resolutions were adopted: That forwarded abstracts should form the basis of settlement and that all way bills dated in the month be included in the settlement for that month, and the statement shall be accepted as rendered by the forwarding road. Corrections to be made in the current month as far as practicable and after discovered differences to be adjusted in subsequent settlements. All business to and from Pacific Coast terminals is made an exception to this resolution, such business to be settled as at present.

That companies making abstracts forward them to lines in interest on or before the 15th of succeeding months.

That commencing with business for January, 1888, all joint accounts for freight billed through over two or more lines shall be settled monthly. A summary to accompany abstracts, showing amounts due respective companies, including intermediate lines, and from whom amounts are due: the differences between the balances due respective companies rendering abstracts, where there are two abstracts, shall constitute the amount for payment. The debtor company shall settle the balance due by it on or before the 25th of the month in which the abstract is rendered. All through waybills shall be examined without delay by the company receiving them. Notice of



any alterations shall be forwarded without delay to all companies interested.

That amounts due intermediate lines for transportation or other charges be settled monthly, based on copies of abstracts referred to. Copies of such abstracts shall be made by the company making the original, and be rendered at the same time; the company collecting money to settle with the intermediate line for the amount due. Settlements shall be based on abstract without change and without reference to whether the money has been collected or not, such settlement to be made by the debtor line not later than 25th of month. Duplicate way bills shall be sent to accounting officers of intermediate lines by the company making the original way bill in order that they may be kept advised in reference to said joint billing.

It was also resolved further that in view of the requirements of the Inter-state Commerce Commissioners in regard to uniform reports, a committee, which was appointed by the convention, be continued and empowered to call a meeting of the convention at some convenient point, at such time as such committee might deem proper.

The Chicago, Burlington & Quincy gave notice that it did not agree to make settlements of joint freight accounts on the basis of forwarded abstracts, but this was the only dissenting road.

#### Uniform Couplers for Freight Service.

##### PROGRESS REPORT OF THE SHINN COMMITTEE.

Under date of Nov. 30, 1887, this Committee makes a progress report which is given below nearly in full.

The Committee authorized by certain railroad companies to act for them in selecting for their adoption a uniform draw-bar and coupler for freight service, has made very material progress in the investigation of the subject. \* \* \* April 9, 1887, Wm. P. Shinn was elected Chairman, and on April 27 Mr. Edward Vernon was employed as Secretary.

On April 28, the Committee invited the representatives of sixteen couplers, to furnish each two small trucks, with two of their couplers mounted upon each for the purpose of a preliminary investigation. These preliminary tests were made on June 7 and 8, upon a temporary track \* \* \* provided with suitable curves to test the action of the couplers. At this test there were presented automatic couplers of the two prominent types, as follows:

* McKeen.	+ Janney.
* United States.	+ Dowling.
* Marks.	+ Thurmond.
* Perry.	+ Browning.
+ Barnes.	+ Titus and Bossinger.
+ Hein.	

Those marked \* are link and pin, and those marked + are vertical hook couplers.

This test was made for the purpose of enabling the committee to see the exact construction and mode of operation of each of the contesting couplers \* \* \* and to observe which of them would couple with the others, and with what facility. Information was also obtained from various sources regarding the cost of the several couplers, the extent to which they had been used, the cost of maintenance, as compared with the ordinary links and pins, and other information desired by the Committee.

The Committee also obtained a report of the tests made at Burlington, Ia., with the vertical hook couplers in trains of 50 cars, which demonstrated conclusively that the use of the vertical hook was no obstacle to starting heavy trains.

The Committee adopted the following resolution on July 27:

*Resolved*, That after a full consideration of the results of the preliminary tests, made under the direction of the Committee, and in view of the evident superiority of a class of coupler of the vertical hook type, which will couple to and with others of the same class and type, this Committee will admit to further consideration only such couplers as are of the type known as the Janney type of vertical hook couplers.

The Committee had previously appointed Capt. O. E. Michaelis, Ordnance Department U. S. A., their expert to make physical tests of the several couplers, and at the meeting on July 27 a statement from Captain Michaelis was read by him to the Committee, outlining the tests which he considered desirable.

At the same meeting the following was adopted by the Committee:

*Resolved*, That the Secretary be instructed to call upon the owners of the couplers, which are to be further investigated by the committee, and request each to furnish the committee with five cars of 40,000 pounds capacity, or over, equipped with his coupler and delivered at such point as may be arranged for, where service trials may be made in trains, and that the owners of such couplers as do not already couple with the Janney, be requested to make such modifications as will enable them to do so, and use only such modified couplers on the cars sent to the Committee.

By the courtesy of the General Manager of the West Shore arrangements were made for the service test, to take place in the yard of that company, near Weehawken.

The first service test was made Oct. 14 with five Pennsylvania Railroad cars, equipped with the Janney freight coupler, and five Pittsburgh, Cincinnati & St. Louis cars equipped with the Dowling automatic coupler. The cars having each type of coupler, coupled readily with themselves, and the Dowling and Janney coupled with each other, and uncoupled without difficulty, on the straight and curved tracks, including reversed curves on switches. \* \* \* The hook of one coupler, which was coupled to an ordinary draw bar with a link, was broken, and it exhibited a fracture, which indicated that the material was not properly applicable to that purpose. The extreme test of coupling the Dowling with the Janney on a 31½ degree curve in the Weehawken Dock Yard demonstrated that while each coupler would couple with its own class it would not couple readily with the other on that curve.

On Oct. 15 the Committee held a meeting, and received a verbal report from Capt. Michaelis of the physical tests made by him upon which the following was adopted:

*Resolved*, That Capt. Michaelis be authorized to communicate with either of the contestants, the results of his tests, as far as they develop weakness or defects in their own couplers, but such information not to be imparted to the owner of any other coupler than the one reported upon.

The Chairman having received a communication from parties in interest, asking for an extension of time, and an opportunity to submit other couplers for the service test, the time was extended to Nov. 5 and subsequently to Dec. 15 in order to permit the Barnes and Thurmond couplers to be represented as well as those heretofore tested.

\* \* \* A portion only of the physical tests proposed were made, and on Nov. 12 Capt. Michaelis made a report, of which the following is a synopsis.

#### REPORT OF THE EXPERT ON PHYSICAL TESTS.

The test was made with a 1,640 lb. falling weight.

No. of blows.	Fall, ft.	Momentum of each blow, equivalent to 30-ton car, moving at speed given below.
1	6	3 miles per hour.
3	9	3.66 " " "
3	12	4.25 " " "

During the first series of these tests, each coupler was placed on its own draw-spring, and during the second rested on a cast-iron block with elastic backing. The couplers were placed vertically knuckle up.

**FIRST SERIES OF TESTS.**—Coupler No. 1 under 6 ft. blow showed slight bending of the axial pin and knuckle compression; this increased with each blow. On the third 9 ft. blow, the pin showed shear strain, and after that blow the knuckle was immovable. The first 12-ft. blow locked the knuckle; the second developed a crack at rear of knuckle arm, the third destroyed the coupler. Pin had sagged 0.4 inch.

Coupler No. II., stood the blow fairly well. The knuckle showed continuous compression, and after the seventh blow, the axial pin was found slightly bent. At this blow the drawhead shank pin bent and cracked through the key hole.

Coupler No. III. showed throughout the test slight but progressive bending of the pin and increasing knuckle compression. At the sixth blow a crack was developed through the knuckle arm, and the knuckle shank no longer cleared the draw-bar opening. At the seventh blow the knuckle arm was broken completely off in two pieces. The pin showed a sag of 0.08 in.

Coupler No. IV. showed progressive compression under each blow. At the third blow the knuckle broke and the hook rotated off its shank. The fracture showed that the metal was not adapted to the purpose.

**SECOND SERIES OF TESTS.**—Coupler No. I. went to pieces on the second blow; the pin showed a sag of 0.24 in.

Coupler No. II. showed slight but progressive bending of the axial pin with each blow as well as knuckle compression. The knuckle showed progressive distortion. After the 7th blow the knuckle shank was thrown 1 in. out of its normal position, the head cracked at the seat of the knuckle shank end.

Coupler No. III. showed slight but progressive bending of the pin at each blow. At the 5th blow, the guard arm cracked at the junction of the flat portion of the head on the upper side. The pin had sagged 0.08 in.

Coupler No. IV. The knuckle broke at the first blow. Being replaced with another knuckle of different and more malleable metal, the first blow showed a knuckle compression of ⅛ in. The second blow, 9 ft., showed additional compression of ¼ in., and at the third blow 9 ft., the head went to pieces, the knuckle being unharmed.

Freight car couplers are used, as both couplers and buffers. Couplers should be constructed of a metal that will stand severe impact shocks without distortion or breakage. The material must be sufficiently strong, and housed with absolute security. Practical construction limits the size and weight. Within these limits it is clear that a knuckle strong enough in itself must not depend for support on an axial pin. The shocks are cumulative in their effects, and there must come a time, as exemplified in the coupler designated as coupler No. 1, that the sag of the pin first interferes with the operation of the hook, and then leads to the destruction of the head, because the strain is brought upon a part not intended to bear it, or as in that designated as No. III., of far greater strength, where the slighter sag of the pin does not interfere with the working of the knuckle, but where it also leads to the breaking of the head as described. Hence the Committee will be perfectly justified in deciding that no coupler can meet the requirements of the freight service, which from the very nature of its construction permits strain upon a supporting pin. There is also another requirement: Upon receiving the blow, the knuckle must virtually be one with the head, and be so seated as to call out its full resistance precisely as does the link and pin coupler. In none of the couplers presented to the Committee, has this essential requisite been made. The representative of but one of the couplers have taken advantage of the privilege accorded to competitors, to acquaint themselves with the results of the tests, and are understood to be endeavoring to profit by them. The tests already made fully support the wisdom and necessity of the Committee's establishing these two requirements as pre-requisites to further trials, and as vertical hook couplers can comply with them, no hardship is imposed.

(Signed)

O. E. MICHAELIS, Ph. D.

The Committee submits the foregoing report of progress, to account for its delay in coming to a decision, with the opinion, as expressed in the report of our physical test expert, that none of the couplers presented fulfill the conditions requisite to adoption by this Committee, as a coupler which it can recommend to its constituents. While modifications are pending in the form of the head and hook and in some details of the coupler, the Committee have considered it unwise to urge the competitors to prepare for further tests, until they could make such modifications as seem to them necessary to meet the requirements of the Committee. The Committee has throughout been actuated, first by a desire to adopt only such couplings as would unquestionably meet with the approval of the companies represented by the Committee, and second to put the contestants to as little expense as could reasonably be done, consistent with attaining the object of the Committee.

(Signed)

WM. P. SHINN, Chairman.

#### Composite Ties.

An improved system of laying track has been patented by Joseph Seidl, of Prague, Austria, the chief features of which are shown in the accompanying illustrations, reproduced from the Austrian *Eisenbahn Zeitung*. In order to combine the advantages and eliminate the defects of wood and iron ties a combination tie is used consisting of a wooden tie, the upper surface of which is covered with a metallic plate inclined at the ends.

The rails rest on the inclines and are thus canted inwards, the top of the head being normal to the coning of the tires.\*

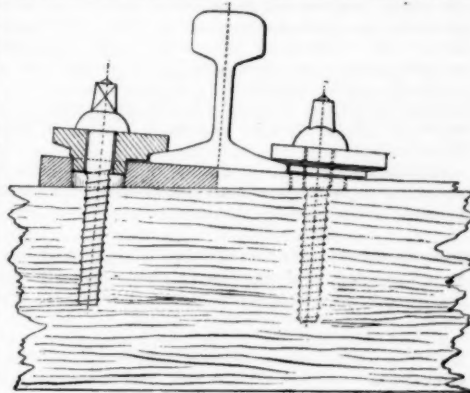
It is claimed that the gauge can be better maintained, and greater durability is secured. It is designed especially for curves, where the tie-plate can be used on every tie or on every second or third tie, according to the radius of the curve.

This tie-plate and the rail are fastened to the wooden tie by means of wood screws and peculiarly shaped clamps. The

\* This practice of canting the rails is universal in Europe.—En. RAILROAD GAZETTE.

clamp consists of an eccentric plate with a conical addition. This cone fits in a corresponding space of the tie-plate. The weight of each clamp is about 2 lbs. 8 oz., and the wood screw weighs about 1 lb.

It will be seen that each of the four faces of the rectangular washer or clamp is a different distance from the hole for the wood screw. The gauge can, therefore, be varied ¼ in. simply by replacing the washer with another face or edge bearing against the flange of the rail. The hole for the screw does not, therefore, need reboring in the tie when the gauge is changed. When the face D is against the rail, the edge of the flange is ¼ in. from the edge of the circular hole in the tie-plate, and similarly when the wood screw is slackened a few turns, so that the clamp can be lifted sufficiently to be turned to the face C, the gauge can be altered ⅜ in.,



Composite Tie and Eccentric Washer.

the difference between D and C. It will be observed that the clamp has no tendency to turn, and that any strain tending to spread the outside rail is resisted by the fastening of both inner and outer rails, and by the friction caused by the weight of the wheels on both inner and outer rails pressing the tie-plate against the tie.

Assuming that one wood screw is as effective as one spike, the total resistance due to the fastenings would be four times that of the ordinary method of using four spikes per tie, while the resistance due to friction would be double. It would therefore appear that this method of fastening, though expensive, offers considerably greater security against rails spreading on curves than is afforded by our present system of spikes.

#### THE SCRAP HEAP.

##### The Fast Orange Train.

The "fast orange despatch train," from Jacksonville, Fla., to New York, started on Dec. 3. It will run regularly with Florida fruit to the Northern markets, making time almost equal to the passenger trains.

##### In the Dark.

He slept days and made up berths all night. Truly he began making up berths at Jersey City, and when he got through, about daylight, it was time to being to unmake them again. All night I could hear him opening and shutting the berths like a concertina. He sang softly to himself all night long.

You must camp a little in the wilderness

And then we'll all go home.

And played his own accompaniment on the berth.

When in repose he was generally asleep with a whisk-broom in one hand and the other hand extended, with the palm up, waiting for a dividend to be declared.

He generally slept with his mouth open, so that you could read his inmost thoughts, and when I complained to him about the way my bunk felt he said he was sorry, and wanted to know what cell I was in.—Bill Nye.

##### Inexpensive Caution.

Old lady (on Southern railroad)—The fire's gone out in that stove, young feller.

Brakeman—Yes, ma'am. You see we're goin' to strike a stretch of poor track, and as the train's an hour late, the conductor allowed we'd better let the fires go out.

##### Freight Yard Strike.

All the yard brakemen in Dayton, O., went out on strike on Dec. 6. The strikers demand Cincinnati prices. They are now being paid \$1.75 a day and ask \$2.10. The Chicago, St. Louis & Pittsburgh at once brought a crew over from Xenia, and that road sent out a train, but no effort was made by the strikers to interfere with it. They talked to the men and tried to influence them not to go to work, but attempted no forcible measures. No trouble is anticipated. All of the freight yards are full and the roads are greatly inconvenienced.

##### The Devious Ways of Boston.

A lady who had got into a Highland car at the South End was surprised to see it turn into Northampton street. Fearing that she would be taken out of her way she hastened to inquire of the conductor where the car was going. "I don't know," replied the collector of fares, "but I'll ask the driver." —Boston Post.

##### To Build a Palace Car Factory.

It is stated that the Wagner Palace Car Co. will build a factory on the 30 acres of land between the Spuyten Duyvil & Port Morris Railroad and the property of the New York & Harlem Railroad Co., on what was lately known as Sherman avenue and 153d street, recently purchased from Cornelius Vanderbilt for \$203,000. It is understood that extensive buildings will be erected there for the construction of sleeping and palace coaches. These buildings will, when completed, become, it is expected, the manufacturing centre of the sleeping car company's operations, and its principal shops will be located there.





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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

It need hardly be again pointed out that none of the systems of continuous heating brought forward need be considered as indivisible, to be adopted or rejected *en bloc*. If Jones has an admirable coupling and utterly inadequate arrangements for heating the car when the engine is detached, it by no means follows that Jones must be thrown out altogether. It is wiser to combine Smith's admirable plan of storing heat with Jones' good coupling, and if, as seems possible, Brown's flexible metallic connection is far superior to a hose, it would be well to adopt that good point of Brown's system and reject his other details, which are manifestly inferior to those of his rivals. A combination of the good points in the various systems ought to make a really first-class system of continuous heating unattainable in any other way and superior to any one existing system.

The increase of wealth in the country at large and the spread of business facilities has an incidental effect on the time of the shipment of freight, in one instance at least. The elevator proprietors at St. Louis have complained lately that the grain which formerly came to them for storage through the winter, or until a favorable time for selling, is now held at the country shipping stations, the increasing facilities at these latter places and the growing wealth and credit of country bankers enabling this to be done. Large elevators are thus in danger of becoming mere transfer houses. This practice is said to be spreading in Southern Illinois and Iowa and throughout Missouri and Kansas. Another thing that troubles the elevator men is the increasing use of 34-ft. cars, which reduces the capacity for unloading and increases the expense of handling cars. This feature has long been a petty annoyance at freight houses where the doors in the building have been spaced for 28 or 30-ft. cars, and the platform is not very wide; but in an elevator it is worse, because the spouts must be opposite the car door, while at a freight house the trucking or rolling of packages can be more or less readily adapted to the inconvenient surroundings. With spouts arranged for short cars, the only way to handle long ones is to disuse every alternate spout or expend considerable more time and labor in switching and pushing; in fact the latter is necessary in either event.

In Mr. Simon Sterne's report to the United States government on the railroads of Prussia, he called attention to the fact that there was very little classification of goods; and he obviously regarded this as a most advantageous state of things for every one. Even at the time when he wrote his report the statement was somewhat misleading. It was strictly true only of parcels freight, which formed of course but a small fraction of the whole. For five-ton shipments there were two classes, and for car-load shipments four. The classification was based on value, and the rates for the lowest class were only two-fifths those

for the highest car-load class, and less than one-fourth of the parcels rates. Besides this, 60 per cent. of the tonnage was carried at non-tariff rates. This is very far from being a system of uniform rates independent of value. But Mr. Sterne's statement is likely to be even less true in the immediate future than it has been in the past. Arrangements are in progress for a second-class parcels rate; and although this was opposed by some of the South German railroads, it is understood that the more serious opposition has been withdrawn, and that the change is likely to go into effect. This change, if really carried out, will mark a distinct abandonment of some of the principles of railroad regulation for which many German statesmen have so long contended. It will mean that state railroads as well as private ones must abandon the pretense of basing rates on cost of service. Hitherto most of the rates have involved exceptions to the avowed principle; in the future all of them will. The mileage rate proposed for the new class is about 0.15 cent per hundred; that is to say, about two-thirds the general parcels rate, or a little more than the car-load rate for first-class goods. So radical a change as this, adopted suddenly, would seem likely to create great disturbance; unless indeed it be true that low-class parcels freight has been largely carried at special rates hitherto. In any event the effects of the change will be watched with interest.

A further, and an apparently determined, attempt to infuse a little common honesty into a branch of freight traffic practice where it is conspicuously lacking, has been made by the Western roads in perfecting the organization of the Western Inspection Bureau, as chronicled in our traffic columns. Misrepresentation in the description and in the weight of freight is one of the very worst evils, because it can be made to appear so plausible, and can be invested with so many characteristics, which, if not identical with those of honest practice, are so very near them that many otherwise enlightened consciences are deadened to an almost hopeless extent. It is laudable for a railroad to try to cultivate honesty among shippers, but it will always be hard to convince them that a practice which it is honest for a railroad to indulge in is wrong when practiced by a shipper. Railroad agents who in their eagerness to get or retain traffic have not only winked at, but aided in inventing, devices for twisting the meaning of words, have directly fostered among shippers the sentiment that no dishonesty is involved in these perversions; and fictitious weights used by the roads themselves are noticed by their customers, and adopted as a warrant for "constructive" figures in forwarding orders. One who sees a carriage billed at five or ten times its actual weight justifies himself in stating net weights where he ought to give gross, or in using "estimated" weights, which he is sure are low enough. The action of the railroads in trying to remedy this evil by placing one department to watch over another is a curious illustration of the power of personal influence and of settled habit. As in the case of demurrage, which it is proposed to place under the superintendents' charge, because it is felt that the general freight agents will not have the grit to withstand the blandishments of customers, it seems to be deemed necessary to let not the left hand know what the right hand doeth, so to speak.

The propriety and the necessity of questioning train and station men about the rules that have been given them, instead of blindly assuming that they fully know them, is coming to be more widely appreciated than it has been; and more or less perfect plans for examining conductors, enginemen, brakemen and others, have lately been reported from a number of roads. One of these roads, which may be classed among the very best in the country, found a state of things which amply justified the wisdom of the examinations, and conclusively proved that no road of any consequence can fairly claim that it has no necessity for this testing process.

As a matter of interest to those who have made examinations, and of still greater interest to those who are looking for points as to how to make them, we print in this issue some of the questions used in the examinations on the Chicago, Burlington & Northern. One of the first things that superintendents desire to know is the length of time and the amount of clerical work necessary; these specimens will give a good idea of this; we show about half of the questions asked of trainmen, having selected those which are most novel or interesting. This amount of matter may seem large, but it is to be remembered that oral communication is much more rapid than written. A much larger number of questions might be

propounded to the average trainman with profit, and not take up much of his time. How many freight trainmen ever gave two hours' steady thought to the principles on which their duties should be performed? Yet nobody would question the usefulness of that amount of study and reflection. This catechism is not perfect, of course; it is a first trial, and so is, perhaps, not open to criticism, though we have no doubt the management of the road would be glad to hear from any critic who has put in practice anything better. The views of different minds, looking from various standpoints, can hardly fail to suggest improvement in a production of this kind, and it is to be hoped that superintendents and train masters will read these extracts with a view to putting in actual use these or something like them. Notwithstanding the lengthy nature of this list it must still be remembered that it is really short, as compared with the subject it aims to cover. Many of the questions could be elaborated tenfold; those which are answered by the brief, "use great caution," "good judgment is required," or a similar phrase could be amplified almost indefinitely, and those which are answered by yes or no could be changed to a form requiring a more difficult answer.

Postmaster-General Vilas in his annual report, extracts from which we give on another page, makes some suggestions concerning the personnel of the railroad mail service, which are not without interest to those who have the supervision of similar bodies of men in railroad operating departments. Of the men tried as clerks on the postal cars 25 per cent. have to be dropped at the end of six months. Railroad service is, probably, both better and worse than the mail service in this respect. Railroads in recruiting the ranks of men of the grade of postal clerks can generally find a good degree of ability among their own employes in lower grades; and the proportion of men who must be discharged, or put back after trial, is much smaller than the mail service records show. The post-office department ought, however, to make available a body to recruit from out of the clerks in the post offices in large towns and railroad junctions who would naturally acquire some geographical knowledge, and who ought to have some of the other requirements also.

But railroads may put the matter in another light by asking themselves whether the 25 per cent. of inefficient were not justly dropped, and also whether if the railroad standard were as high as the government's, and as high as it ought to be, there would not be a larger number of discharges, or at least of cases recognized as needing further education, among train, station and enginemen. An officer who finds the smallest number of men who must be weeded out may or may not be the most efficient chooser and organizer. He may have been more careful and systematic in selecting his men, or he may have been more negligent in ridding himself of those whose inefficiency appeared only after a trial.

The Postmaster-General's recommendation that the government own and maintain an equipment of postal cars instead of using those furnished by the railroads, seems ill-advised and apparently is made without much reflection. The report does not specify the amount paid per car, per mile, or per day. An even sum per mile of road seems to be the unit, based on a certain number of regular trips weekly. Thus the Boston & Providence receives \$50 per year, per mile of road, for what appears to be one car each way daily, equivalent to about 8 cents a mile. Others seem to receive smaller sums. The actual basis, therefore, cannot be ascertained, but it is according to mileage, and doubtless depends also on the amount of mail carried, and the speed. If a road receives pay by the ton for carrying the mail, the compensation for room occupied by clerks and their belongings, empty bags, etc., must depend upon the quantity of mail as well as the time occupied.

A car, the capacity of which is ten tons, but which actually carries only one ton, must be paid for in the shape of rental to compensate for the nine-tenths of its capacity not used; a car which makes 500 miles a day can be let at a lower rate per mile than one which makes short trips and stands idle 10, 15 or 20 hours daily. The Postmaster-General seems to assume that the roads would be willing to haul a ton of mail in a \$4,000 mail car as cheaply as they would carry it in the end of a baggage car, and that they would ask no more for hauling such a car over the road every day than they would for allowing it to stand on a side track. The practical difficulties which would ensue on the adoption of this idea, such as the securing of uniformity of cars and arranging for their proper



care and repair, are not even alluded to, though they would unquestionably be great. No road has a natural liking for foreign cars, and whenever the question comes up, as in the case of the Burton stock car before the Inter-state Commission recently, they bring forward cogent reasons for preferring to handle only their own cars. The reasons which operate to make roads voluntarily use sleeping cars belonging to a foreign owner would be largely or wholly wanting in the case of mail cars. At important railroad centres it might be possible to make spare cars available on two or more different lines, but this small advantage would be largely neutralized by the fact that all mail cars are fitted up with special reference to one route, and that therefore one used out of its regular sphere would be but little more valuable than a baggage car with a plain table in it.

In the Northwest, as in the West and Southwest, it is hard to say of any one railroad that it has found a place at which to stop. There are now six roads connecting Chicago with St. Paul and Minneapolis, and these latter cities have more or less direct routes by five lines to the ports of the west end of Lake Superior; yet several other Chicago roads are now credited with the intention to build to St. Paul, and at least three of the projected extensions to Lake Superior may fairly be called probable. The people of St. Paul and Minneapolis, and of the country of which these cities are the great market and trade centre, expect great things from the new routes to the sea, by way of the Sault Ste. Marie, and still more from the growing lake trade by Duluth, Superior, Bayfield and Ashland. It is commonly said, too, that much of the commerce with the East by the old trunk line routes will pass by the gates of Chicago without entering. That something of all these expectations will be fulfilled there can be no doubt. The country tributary to Chicago is so vast, her terminal facilities and railroad connections are so extensive, her trade is so firmly established and the accumulation of capital so great that she has nothing to fear from the growth of St. Paul, Minneapolis and Kansas City. Their greatness will still remain tributary to hers. But it is a fair supposition that the proportion of the Northwestern trade handled at Chicago will diminish. From St. Paul to Duluth is 154 miles by the St. Paul & Duluth, and from St. Paul to Chicago is 410 by the Chicago, Milwaukee & St. Paul, and 409 by the Chicago & Northwestern. These are respectively the shortest routes now worked. It is obvious that the vessels which carry the wheat, iron and other products of the Northwest eastward from the head of Lake Superior can lay down coal and heavy merchandise on the wharves of Duluth, Superior, Bayfield and Ashland as cheaply as they can be landed at Chicago, and the shortest line by rail from Duluth to St. Paul is less than 37 per cent. of the shortest Chicago-St. Paul line. We should naturally expect, therefore, that while navigation is open, an important part of the trade of the Northwest will pass through Lake Superior, and we actually find that the tonnage passing through the St. Mary's Falls Canal has been as follows:

1887.	1886.	1885.	1884.	1883.	1882.
5,600,000	4,219,397	3,036,000	2,997,834	2,042,259	2,468,088

But further than this, the towns at the head of Lake Superior are ambitious of being something more than summer ports for wheat, coal and iron. They hope to become centres of jobbing trade and manufacture for the great agricultural regions behind them, and to some extent their hopes will doubtless be realized. St. Paul and Minneapolis, too, are growing as manufacturing towns, and in some of those manufactures in which fuel is a small part of the cost of finished product they are pretty sure to become more and more independent of the Eastern towns. The railroads are encouraging diversity of crops and of industries, and take active interest in promoting new enterprises. The stock yards of St. Paul and Minneapolis are already extensive and well equipped, and the dressed beef and packing business is sure to grow in importance. A creamery lately established at St. Paul is one of the largest in the world.

Thus, while wheat is, of course, and will remain, the great staple of the Northwest, the railroads and the cities of that region have begun to be less exclusively organizations for handling that product and for supplying those who raise it.

Considering, then, the immense area north and west of St. Paul now open for settlement and its capacity for supporting a dense population; considering the fast growing importance of the Lake Superior country, and seeing the wonderful enterprise energy and public spirit of the people, it does not seem so remarkable that, as one citizen lately said, "the woods up here are full of railroad surveyors."

#### Automatic Couplers for Freight Cars.

With a view to ascertain what progress is making in the use of automatic couplers of the various types used in freight service, and to get at the prevailing sentiment with regard to the recommendation of the Master Car-Builders' Association, we addressed circulars of inquiry to the railroad companies. Replies have been received from 159 roads with an aggregate freight equipment of 340,500 cars. Some of the important and progressive companies have not given information, and it would be unfair and misleading to publish the figures received of the individual couplers in use. The data obtained may, however, be taken as fairly representing the relative numbers in use of the various types, and are as follows:

	Cars equipped.	Per cent.
Link and pin, non-automatic	319,350	93.79
"    "    "    "    "    "    "    "	18,200	5.35
Vertical hook, M. C. A. type	2,550	0.75
"    "    "    "    "    "    "    "	400	0.11
Totals	340,500	100.00

The link and pin non-automatic class includes most of the improved forms of couplers and draw-bars, specific mention being made of nearly 90,000 cars equipped with the Potter, Safford, etc.

Poor's Manual gives 846,000 freight cars as in service on the roads reporting in 1886. Could complete statistics be had from all the companies, undoubtedly the percentages given above would be changed somewhat, but they are sufficient to show what a very small foothold any of the automatic couplers have yet secured. Of the roads answering our circular those having an aggregate of 32,000 freight cars replied unequivocally that they have adopted, or will adopt, for new equipment, the Master Car-Builders' type of coupler. Many others who voted in favor of it are waiting to learn more about the various couplers, or to see what is most likely to come into general use on the lines with which they interchange. Some roads expressed themselves as not in favor of the type, and a decided majority were not prepared to take any action. On the whole, this inquiry confirms the opinion that relatively few railroad officers are yet convinced that any one of the automatic couplers now in use fills all the conditions of actual service so well as to warrant equipping with it. It shows that there is a good deal of work to be done yet in experiment, and in analysis of results of tests, as well as in the propaganda.

The recent vote of freight train hands and yardmen on the Lake Shore has already been referred to. Out of a total vote of 33,256 give preference to a non-automatic link and pin coupler. This may, however, be reasonably explained as a large majority for uniformity rather than for the present prevailing way of coupling, on its merits. The men are said to have had experience with "nearly all kinds of couplers in use," but, in fact, their experience with automatic couplers could have been little more than enough to teach them the evils of a diversity of forms. As an argument the vote can have weight only as against diversity.

The conclusion reached by Captain Michaelis in his physical tests on four varieties of the Janney type of draw-bar does not seem to be entirely justified by the results as given in another column. The pins bent under falling weights, and he therefore argues, dispense with the pin. But as the knuckles also bent, should we say abolish the knuckle? The remedy for parts of a car which break is usually to strengthen rather than to abolish those parts. They may be either enlarged, or altered in form, or made of improved material, and it is not quite evident why one or more of these three remedies should not be applied to the knuckle pin.

The test of a falling weight was equally applied to all four vertical plane couplers tested and all appear to have suffered some damage. The experience with the Westinghouse and other trains at Burlington shows that a train wholly equipped with one type of coupler will suffer very little damage, even in unusually hard service, for the shocks there far exceeded anything permissible in ordinary service. It is therefore open to question whether Captain Michaelis' tests were not more severe than any bumps likely to occur with fair usage in ordinary service.

#### Flexible Connections for Continuous Heating.

The most uncertain element in the cost of continuous heating is the durability of the flexible connections between the cars. Many forms of hose and substitutes for rubber hose have been proposed, and as the question is somewhat novel, it may be well to briefly review what experience can teach us as to the probable merits and demerits of the various flexible connections proposed. Experience with air brakes has shown that the life of hose is materially shortened by high pressure and that the use of air not

exceeding 60 lbs. pressure will make a serious difference in the durability of hose, which rapidly fails under 80 or 90 lbs. pressure. This tends to show that the usual style of canvas and india rubber hose is not strong enough to stand any considerable pressure, and fails from that reason. Mr. Gold therefore proposes to combine with the usual rubber hose, a woven wire hose in order to give strength. Many attempts have been made to improve rubber hose, and it is tolerably evident that nothing but first-class hose will stand the very trying test of steam heating. The combination of pressure, heat and moisture is especially deleterious to india rubber, and the chances of being of frozen stiff with a heavy coating of ice, and rubbing against brake hose, draw gear, etc., will not lengthen the life of continuous heating hose.

The short and uncertain life of rubber hose has led to many proposals to substitute a flexible metallic connection, which at any rate is unaffected by the heat and moisture of steam, and can evidently be made strong enough to resist any pressure. The inevitable working joints in any metallic flexible coupling are, however, grave disadvantages, and if a durable rubber hose can be obtained it will doubtless be preferred to any metallic coupling. In the early days of railroading, when rubber hose was unknown, either riveted leather hose or metallic couplings with sliding and ball and socket joints were used on the feed pipes between engine and tender. Leather, though still largely used for fire engine hose, is of course quite unsuitable for steam and therefore we need only consider metallic connections. The constant and irregular movement of the rubbing surfaces soon rendered the joints leaky, and the accumulation of dust and grit did not tend to lubricate the surfaces or lessen the wear.

The metallic coupling, in which flexibility was secured by a combination of the ball and socket joint, and the sliding joint, was therefore abandoned when the manufacture of rubber hose became an established fact. The superiority of the latter for the conveyance of water at a low pressure is thus established by the teachings of experience. Though it is doubtful whether we could now improve upon the workmanship of the old metallic ball and socket joints, it is certain that the art of making rubber has advanced considerably, and that, were the experiment again tried at the present time, rubber hose would achieve an even more decisive victory over the old ball and socket joint.

This, however, does not decide the question as to whether metallic or rubber connections are best for continuous heating. The heat of the steam places rubber at a disadvantage, while many metallic coupling dispense altogether with both ball and socket and sliding joints, and employ only rotating joints. The latter give equal flexibility and have the advantage of being closed against the admission of dirt and grit. Moreover, the wear of two flat rings rotating on one another is nearly equal at all points, however uneven the amount of movement, while the wear of sliding surfaces is very unequal under such conditions, the points subjected to the greatest movement wearing more than those that are seldom brought into contact. The difficulty of keeping a valve stem tight, owing to the varying travel of the valve, is a case in point. It is also easier to take up the wear of a flat surface than of a sphere. It therefore appears possible that flexible metallic couplings, with rotating joints, will prove more satisfactory and durable than those made on the old principle of the feed-pipe coupling between engine and tender.

On the other hand the ball and socket form has the smaller number of joints. In a coupling between two cars, one sliding joint and two balls and sockets are all that are necessary, making but three wearing joints in all to obtain universal motion. Where rotating joints are used, one non-wearing joint and some six wearing joints are absolutely necessary, and even this arrangement does not give absolute freedom, as no provision is made for the twisting motion of the cars in running over a change of superelevation, when the right hand side of one car may be elevated and the corresponding side of the other car depressed.

In comparing the relative merits of flexible metallic couplings with ball and socket and rotating joints, it would appear that the latter have the greater number of joints, which may, however, be expected to be more durable and less leaky than the less numerous joints in the ball and socket style of coupling. Whether either form of metallic coupling will prove more satisfactory than hose is a point that can only be settled by experience.

Rubber has the great advantage of being tight until it is completely worn out. If the hose is properly secured at each end and the joint of the coupling itself



is tight there need be no fear of leaks, however great the oscillation of the car, presuming, of course, that, once coupled, the junction points of the couplers have no motion on one another. Rubber hose here possesses a great advantage over metallic joints which must incessantly move upon one another as the train is running.

#### The Inter-state Commerce Commission Report.

It is needless to say that the report of the Interstate Commerce Commission is an able document. Those who have not followed the decisions of the Commission in detail will find it a convenient summary of the principles which it has adopted. Even those who have read its decisions most carefully will find in this report much general matter which is new and suggestive; not on transportation law in its narrower sense—for this they must look to the cases already argued and decided—but on some of the broader questions of public policy which are to guide the railroad legislation of the immediate future.

Although the Commission expressly declines to recommend any considerable changes in the Act, they do not refrain from indicating one or two minor ones which seem desirable. They call attention to the fact that many of the evils incident to railroad management are also common among carriers by water. Not merely do these things do harm in themselves, but they also make the enforcement of the existing law much more difficult, because it is to-day applied to one set of competitors and not to another. They suggest to Congress the question whether carriers by water as well as by land ought not to be required to publish their rates, maintain them steadily, and apply them impartially without secret rebates. "Such rules," they say, "prescribed and enforced, would take away much of the present temptation on the part of carriers by land to violate or evade the law, and would, besides, be intrinsically just and right."

With regard to express companies, it is not so clear what ought to be done; in fact, it is hard to say at present just how far the act applies to such companies at all. The Commission, with some hesitation, expresses the opinion that as far as this business is done by the railroad companies themselves, directly or indirectly, the provisions of the act will apply; but that it is more doubtful whether the express companies which are independent of the railroads come under the operation of the Act. If this really be the law, it is palpably unfair, and the Commission does not hesitate to say so. "The question is one which Congress ought to put beyond question, by either expressly and by designation including the express companies, or by excluding them. The railroad companies that see fit to do their own express business ought not, either as respects principles or methods, to be subjected to any different control from the independent express companies. If the latter are not within the contemplation of the act, all express business, by whomsoever carried on, should be excluded." And what is true of express companies is also to a greater or less extent true of sleeping-car companies and of outside corporations for the transportation of certain classes of freight.

No fundamental change in the methods of railroad economy is suggested. With regard to classification and to the various attempts to base rates on cost of service solely, the Commission takes occasion to repeat briefly but clearly the principle that rates must be based on value of service rather than on cost. In all this part of the report, however, the language is necessarily guarded, because of the fact that certain cases involving the most delicate questions of principle—notably the Car-load Rate case—are now under adjudication. Railroad associations are, on the whole, spoken of with decided approval; while the brief remarks on the pooling system are by no means of an unfavorable character. The widest interest will be felt in what the Commission says with regard to the operation of the long and short haul clause. As the result of recent systematic inquiries the conviction is expressed that "while less has been done in the direction of bringing the freight tariffs into conformity with the general rule prescribed by the fourth section than some people perhaps expected, there has nevertheless been a gratifying advance in that direction, and there is every reason to believe that this will continue." In large sections of the country they report that obedience to the general rule of the fourth section is now true without important exception. The transcontinental roads, suffering as they do under Canadian competition, have not yet conformed to this section; neither have the roads in the states south of the Ohio done so, though some have greatly modified their tariffs in that direction.

It is gratifying to note how clearly the Commissioners apprehend the wider economic bearings of the sub-

ject. In this report, which is addressed to the country and not the railroads specifically, they find room to say a great many things which would be somewhat out of place in deciding specific cases. "The question of rates," they say distinctly, "is often quite as much a question of rival interests and localities as between the railroads and any one or more of such localities or interests." The system of tariffs as it has prevailed in the past has been one which favored trade centres. Its sudden termination would to some extent check the prosperity of many important places. The benefit which non-competitive points receive from the law must be largely at the expense of the competitive.

They also show with clearness that, if any railroads suffer, it will be the weaker ones; those which cannot afford proper facilities for local business without the aid of competitive business which they are forced to secure by special concession. It is quite clear, they say, that the more powerful corporations in the country, controlling the largest traffic and operating on the chief lines of trade through the most thickly settled districts, can conform to the statutory rule with much more ease than the weaker lines whose business is comparatively light and perhaps admits of no dividends. In their interpretation of the short-haul clause the Commissioners have not always been able to do justice to these facts, because they were trying to interpret an existing law; not to decide whether the principle involved was good or bad. But in addressing Congress and the people they are able to present the issues clearly and forcibly. In attempting to conform rates to a preconceived system, Congress is not strengthening the weaker communities at the expense of the vigorous and profitable railroads; it is primarily at the expense of the competitive centres. It is indirectly at the expense of the weaker railroads which are so burdened with fixed charges that they have little freedom of action. It is probably, in its ultimate effect, at the expense of those communities and localities which are deprived of railroad facilities by the indirect operation of the law in weakening the weaker railroads and preventing the construction of new ones under similar conditions. The Commissioners do not say all this, but it is quite clear that they see it. In how many cases the harm done by such a course may equal or outweigh the probable good, they do not attempt to decide. Congress has made the law, and they are content to interpret it in such fashion as to secure the greatest amount of good with the least amount of harm which is possible under existing conditions.

#### Faults in Cylinder Designing.

One of the most glaring faults in the design of steam cylinders, especially noticeable in slide-valve engines, is the envelopment of the body of the cylinder for a large portion of its circumference with the exhaust passage. Experience and theory alike point to the advantage to be gained by enveloping a steam cylinder with a jacket containing steam of a temperature higher than that of the working steam within the cylinder, and by just as much as this steam or hot air jacketing is beneficial in securing greater economy in working, by so much is an exhaust steam jacket harmful and productive of very serious loss, both directly and indirectly.

In the first place let us consider what the exhaust from a steam cylinder really is. It is not dry steam, for if it were, its low conductive power would render it comparatively harmless. It is a mixture of steam and hot water, and the water entrained with the steam is in what may be termed a critical condition; that is to say, it is only a trifle below the boiling point for its pressure, that of one atmosphere absolute, and the addition of heat would raise some of it to steam again. As a matter of fact this extra heat is very readily absorbed by the fine particles of water contained in exhaust steam, and further it is in most cylinder designs just at hand to be absorbed.

Now the latent heat of steam is very great and the absorption of heat from the hot wall of the cylinder by the steam escaping along the contiguous exhaust passage is something enormous, for every particle of water escaping at a temperature of 212 degrees may only be raised, it is true, to steam at 212 degrees, but the heat necessary to effect the change of condition to steam, at only the same temperature is no less than 966 units per pound.

The cooling effect on the internal walls of the cylinder by the re-evaporation of the exhaust is bad enough, but not easy to be avoided. There is, however, no necessity to intensify the evil of cylinder condensation by the external addition of a jacket of exhaust steam, the very worst possible material. When necessary to carry the exhaust passage round or partially round the working barrel of the cylinder a core should invariably be introduced in the casting, so as to separate the exterior of the cylinder at least  $\frac{1}{4}$  in. from the wall of the exhaust passage, and this core space may be either simply closed up, or if, as in a locomotive, it can be open to a hot smoke-box, it is possible that good might accrue from circulation through it of the hot gases of the smoke-box. It is bad practice to jacket a cylinder with the steam afterwards to work in the cylinder, but it is infinitely worse to jacket by exhaust steam; better far to put a closed water jacket about the cylinder than do so.

It is nevertheless a fact, and one which has caused us much surprise, that many men who ought to be scientific engineers, considering the positions they occupy, are of the opinion that an exhaust jacket is better than a mere air jacket, for, argue they, is not the exhaust steam at a higher temperature than the air? They entirely overlook several points: First—That an exhaust jacket is constantly replenished with a supply of moist, wet steam at a temperature much below that of the boiler steam in the cylinder, while a closed air jacket contains a few cubic inches of air heated up once for all. Second—That the conductivity of wet steam is enormous, and that of dry air almost nil, even supposing that the air jacket received a constant fresh supply, which it does not. Third—In heating air there is no change from a liquid to a gaseous state, while in heating water until it vaporizes the absorption of heat without change of temperature is enormous.

These facts should be carefully studied, for to neglect or ignore them means a repetition of bad design, which ought to be looked upon as a disgrace. The misfortune is that so many draughtsmen intrusted with the preparation of designs are good mechanics, rather than engineers. Every chief draughtsman should be an engineer rather than a mechanical man, and his chief assistant should be of a mechanical turn of mind. Some of the best machines, as reviewed from the real machinist's view, are marred by the obvious neglect of those scientific principles, and a want of that knowledge of physics which should form a large part of the stock in trade of every man who aspires to call himself an engineer.

It is in physics that we generally notice the more purely practical man is wanting, and often what he does not understand he is tempted to undervalue and neglect because he sees that to carry it out might cost money. The labor involved in properly molding a steam cylinder would be quickly repaid many fold in the coal heap and all the contingent expenses incidental to over-consumption of coal.

Apart from the direct loss due to an exhaust jacket it must not be overlooked that the increase of cylinder condensation is cumulative in effect, and a very slight addition from a direct cooling cause may be the further cause of a very much greater loss in working, for the cooling of the cylinder increases the initial condensation. The increase in the water formed during each stroke again increases the cooling effect on the cylinder, and so on, until the amount of steam entering the cylinder is something enormously greater than can be accounted for by the indicator diagram.

#### The New Car Service System.

In another column will be found a detailed account of the action of the trunk lines on the car-service question. The committee which has arranged the details was appointed Dec. 1, 1886, so that the members are permitted to see the fruit of their labors in just one year, a shorter time than was hoped for by many. Although two roads, the Lackawanna and the Grand Trunk, still hold back, there is a general impression that they will soon come in. The plan now adopted is slightly different from that previously adopted by the Pennsylvania and the Erie, in that it specifically provides that the per diem rate shall be allowed on line cars whenever they are off the road owning them, but that cars owned by individuals firms or private companies shall not be subject to the per diem rate. This is in accordance with the recommendation of the Car Accountants' Association, based no doubt upon the statistics showing that owing to the class of freight moved in private cars and the manner of handling it, that this class of cars earn more revenue in a given time at  $\frac{1}{2}$  cent per mile than regular freight cars will at  $\frac{3}{4}$  cent per mile. It is also to be remembered that private cars generally do not have a home road where they can be held exempt from the per diem charge, and again, that the class of freight carried in such cars is always unloaded promptly and no special measures for hurrying the discharge of loading are necessary. This system also differs from the Pennsylvania plan in another important feature, that of placing the responsibility for the per diem charge on what are commonly called "switched" cars; that is, cars switched to belt lines or junction roads, simply for the purpose of receiving or discharging their loads. The earlier plan provided that the per diem rate in this respect should be paid by the road on which the switching is done, thus transferring the responsibility for the per diem charge with the car until its return. The new plan provides that the per diem shall be paid by the road by which the shifting is done; that is, for instance, on cars reaching Chicago by the Lake Shore, and shifted by Lake Shore engines to the Belt Line for unloading, the Lake Shore is responsible for the per diem charge during the period the car remains for loading or unloading. It will be noticed that under this plan the per diem charge on cars handled by Belt Line engines will be paid by the Belt Line Co.; provided the plan of the Car Accountants' Association is that per diem on "switched" cars shall be paid by the road for which the shifting is done. This latter plan, viewed from a car service standpoint, is perhaps the best of the three, as it anticipates the refusal to pay by the day, which the belt lines or shifting roads which do not now pay any mileage, are sure to make, and so fixes a responsibility for the per diem charge under all conditions, placing such shifting roads in the position of contractors furnishing terminal facilities. It is to the interest of the road for which the work is done to see that such a contractor handles the cars with dispatch; but until some local road of this kind adopts the new system and gives it a fair trial there will be much difference of opinion. Some of these "side-track" roads are so extensive that their operations are very similar to those of a regular carrier, and their status cannot be settled off-hand.



The report of the New York Board of Railroad Commissioners on the railroad bridges of the state is approaching completion, and will be published during the coming winter. In compliance with the law which went into effect Nov. 1, the railroads of the state generally have already provided, or are about to provide, their truss bridges with guard timbers and protecting posts. The most commonly used appliance for this object is the Childs-Latimer system, consisting of the Latimer re-railing apparatus combined with heavy guard timbers, notched down upon, and bolted to the ties, the guard timbers having a wide flare at the bridge approaches in order to catch a derailed truck and guide it towards the rails. At the ends of these timbers are posts 16 in. square, set squarely into the ground, in line with the bridge trusses and distant 20 ft. therefrom. The Board several years ago recommended "a floor system for all openings, including cattle guards, strong enough to support a derailed truck, with guard rails to guide the wheels of the same in such contingency." In more detail the Board has generally recommended for bridges a floor system composed of oak ties at least 8 in. x 8 in. square, and 9 ft. long, spaced not more than 8 in. apart in the clear, and notched down 1 in. upon the stringers, with guard timbers not less than 7 in. x 8 in., laid flat, and not more than 1 ft. outside of the rails, notched down 1 in. upon the ties and bolted to every other tie. The railroads of the state generally have shown a desire to comply fully with the Board's recommendations in these respects.

Mr. Kirkman's Freight Received book is the subject of another letter from F. P. A., who says that the book has been issued in a new form in which six receipts or items appear on one page, each slip being no larger than a bank check. He says that the principle is so good that it should be employed, even if it were deemed necessary to disuse the manifold process; and finally that the aim of railroad documents being to "get there," our advocacy of a regard for beauty and the eternal fitness of things is out of place. There is no necessity of going over this ground again. The larger the number of entries to the page the better, of course, but there is still a large difference between six and forty. The mention of bank checks suggests the bearing of our allusion to aesthetic points. Why is a bank check blank made from an engraved plate? There is a wide difference between the appearance of the average bank check and that of the average freight voucher; what are the reasons for this? Why should one be more elegant than the other? The latter could receive considerable improvement and still be in no danger of usurping the place of the other. F. P. A.'s liveliest eloquence is applied to the argument that the manifold system is a check on dishonesty; but the troubles precipitated by dishonest agents, which he so feelingly describes, are susceptible to other remedies. Railroad men could take profitable lessons in this direction from other lines of business.

The Jersey City station of the Erie was opened for service this week. Drawings and a description of this station were published in the *Railroad Gazette* May 6, 1887, and it only remains to add that the waiting rooms and their adjuncts are very handsome and comfortable. There are a large and well furnished ladies' room and a smoking room, and the restaurant is attractive in appearance and likely to be well managed. In all these elements of comfort the New York terminals of the Erie have heretofore been deficient.

Gov. Lounsbury, of Connecticut, in a letter to the Fairfield County petitioners, declines to call an extra session of the Legislature to consider the matter of grade crossings. He says that the railroad commissioners who apportion the expense of changes under the present law are presumed to be capable of seeing that justice is done, and that the consummation of any unsatisfactory decision of the commissioners may, by appeal to the courts, be prevented until after the beginning of the regular session of the next General Assembly. "In this condition of affairs I am clearly of the opinion that the danger of great and irreparable wrong is not so imminent as to create a case of special emergency, justifying an extra session of the Legislature."

Milk traffic, which is usually regarded as a branch of transportation which must enjoy the best facilities in the way of time, is now carried, in one instance at least, by boat, the Housatonic road, which collects a good deal of milk in Western Connecticut for New York City, having chartered a steamer to take the milk from South Norwalk, the terminus of the Danbury & Norwalk Division, to Pier 49, East River, New York. The milk has hitherto gone by the New York, New Haven & Hartford road.

Mr. C. Powell Kerr requests us to state that the error in the Martin catalogue as to the cost of steam heating was corrected by him in the *Scientific American* of April 30, 1887.

A second or repeated examination for color blindness of 16,200 employes of the German railroads led to a modification of the record of the first and previous examination in 305 cases.

It was discovered that 35 persons were partly and 29 wholly color blind, whose defect was not detected by the first examination. Also that of 189 cases pronounced partially color-blind by the first examination, 45 were entirely color-blind, and 144 not color blind. Fifty-two persons who had been pronounced entirely color-blind were not without color sense.

#### NEW PUBLICATIONS.

##### *A Ride from Chicago to New York on a Freight Train, Under the Protection of the Rote Brake.*

The introduction to this 48-page volume states that: "This little book is dedicated to railroad officials, trainmen and their wives and families, and to the life and accident insurance companies of the United States." The author states that it was intended to haul 10 loaded Erie cars, equipped with the Rote compression brake, in one train, but from unforeseen causes the train was divided into two sections, and the "Ride" on the first section of 25 cars began on July 16 of this year. The run of 269 miles to Marion was made, "not a hand brake having been set." At this point the author inserts the first certificate: "Daniel Churchill, flagman, remarked, as we came to a stop on Boone Grove siding, that that was the nicest run and stop he ever saw made coming down into Boone Grove siding." Daniel's conservatism is shown in limiting his emphatic compliment to observations made on his particular siding.

At Marion the train was further subdivided into sections of 14 cars and 11 cars. It was apparently hoped that these successive divisions would bring the train down to a size capable of being handled without the assistance of brakemen, down the 4-mile, 56-ft. grade at Mansfield. The author explains the first failure as follows:

"This was the first trial our engineer had taking the train down a long steep grade by the Rote brakes alone. He drifted the train down the entire grade so well and perfectly, and had it under such perfect control all the way down that he said he miscalculated the distance he ought to take to make a complete stop on so heavy a grade, and also failing to make proper allowance for the excessively greasy condition of the wheels from the frequent oiling due to hot boxes, he allowed too little distance to make the stop on the grade before reaching the B. & O. R. R. crossing, and becoming somewhat flurried when within 100 yards of the crossing called for hand brakes."

After this failure an exhibition stop was made with the 25 braked cars, caboose, day coach and parlor car on a 56 ft. grade, and at 26 miles an hour the train was stopped in 2,400 feet! The author evidently considers this a gratifying exhibition, as it was more than half as good a stop as could have been made by hand braking.

At Deposit, on the Erie road, "We had our second call for hand brakes. This call \* \* \* was really needless, and the result of a flurry."

On the grade from Susquehanna to the summit the second section got into trouble with its pusher. "In going up this grade the slack must have been taken out, as several brakes got into braking position and were applied by the pusher—not enough, however, to stop the train. This would seem to make it advisable not to recommend the use of pushers with our brake as at present constructed."

The third grand division of the book is occupied with "Outlines of Conclusions Reached," which is rich and valuable reading, too vast to summarize. In view of its own record of experiences this report dwells at great length on the uncertainty of all other brakes.

#### Some Notes in the Northwest.

The St. Paul & Duluth has done a good deal the last summer toward the reduction of all its grades to 15 ft. maximum, and the work will be resumed in the spring. It is the intention that this shall be the maximum gradient in the whole line to Duluth, excepting some 14 miles, from Duluth to Northern Pacific Junction. Here a heavier grade cannot be avoided. The present grade is 90 ft. or thereabout. The company is building a new line, however, to make this connection on a 52 ft. grade, with earthwork and masonry structures, and avoiding several wooden bridges. This new line is estimated to cost some \$40,000 per mile. The business of the road has been very great this season, 15 extra trains a day having frequently been run over its track. There is little doubt that the St. Paul, Minneapolis & Manitoba will shortly build its Hinckley-Superior line, which will relieve the St. Paul & Duluth of a part of the present business.

Surveys have been made and quantities estimated for the line of the latter road to Omaha, but it is not thought probable that contracts will be let at present.

The Minneapolis, Sault Ste. Marie & Atlantic may get to the Sault by Jan. 1, and expects to, but that will depend a good deal on the weather. At any rate, the completion of the line is now not far away. The entrance to Minneapolis now is by the track and terminals of the St. Paul & Northern Pacific. The total length of the line is 494 miles. The maximum grades in Michigan are 30 ft., and in Wisconsin 40 ft. to the mile, and the maximum curves are 4 degrees. The rail is 60 lbs. per yard, with 22 in. angles, suspended joints, laid even. Stub switches are used.

The "short line" trains of the Chicago, Milwaukee & St. Paul, running between St. Paul and Minneapolis, are provided with a useful contrivance to keep passengers from slipping under the wheels. A stout wooden lattice hangs from the body of the car to just below the level of the station platforms, which it barely clears. Between the cars are canvas aprons. It would take considerable ingenuity and trouble for a man to get any of his members entangled with the running gear. For trains of the sort, running short distances, through populous neighborhoods, and often at low speed, and especially in a region where platforms must often be icy, the device must be a valuable one. Under such conditions people are often tempted to board a train while it is in motion, and it is difficult to prevent such attempts. But every railroad man knows that few people can safely get on a moving train, even when it is going very slowly. For trains running long distances the protective device is not applicable, as it would inter-

fere with inspection of the running gear, but the Chicago, Milwaukee & St. Paul only uses it on suburban trains.

This road is also using very extensively the three tie angle bar, thickened in the middle, which was shown in the *Railroad Gazette*, March 23, 1887. At that time it was said that this joint was in use on 1,000 miles of track and that it would be introduced in all new work and renewals. This we learn has been the case. The joint was adopted as standard in 1885.

It was noticed that the trains of the Northern Pacific are equipped with the Westinghouse pneumatic train signal, and officers of the road spoke of it very highly. This ingenious device is not generally known, although it is in successful use on the passenger trains of the Pennsylvania and a few other roads. The Pennsylvania has entirely abandoned the bell cord except in a very few instances where mixed trains are run. For long trains it is particularly advantageous. The signals can be transmitted more quickly and accurately than with a bell cord, in which more or less slack must be taken up before the gong is struck, and when the weight of the cord is liable to prevent a repetition of the stroke. There is also some gain in the fact that there are no bell cord couplings to be dragged through a car, to alarm and possibly injure passengers, and break glass. An unmistakable alarm is given if the train parts.

The observant traveler over the roads of the Northwest must be struck by two facts in the track practice prevalent there. These are the common use of stub switches and the use of even joints. Both of these practices are generally explained by the officers of the roads on climatic grounds. It is commonly said that the amount of snow and ice with which they have to deal makes split switches difficult to keep in safe condition. That they are much used in Norway, where there is as much trouble with ice and snow as in Minnesota, is true; but possibly in Norway more trackmen are employed and more labor is spent in keeping switches clear than generally on Western American roads. In New England, also, where snow and ice are certainly common troubles in the winter, the split switch is in general use on the best lines. The advantages of the split switch in safety, comfort and economy of maintenance of rolling stock are, we should say, hardly debatable, but whether or not those advantages are too dearly bought in very snowy regions may yet be a matter of individual opinion. Other considerations than those of first cost have undoubtedly influenced many of the best railroad men of the Northwest in retaining the stub switch so commonly.

In the *Railroad Gazette* of Dec. 5, 1884, it was shown that even joints were practically in exclusive use in all the territory west and north of a line passing from Portsmouth to Chicago, and thence to Galveston. From a little observation and inquiry it appears that the practice has not changed there in the last three years. It is possible, however, that more thorough inquiry would show some extension into that great territory of the practice of breaking joints. The most common explanation made by railroad officers in the Northwest of their preference for even joints is that in a region where the thermometer falls to —40° F. it is difficult to keep joints up to level. Track cannot be drained to below the depth of ordinary freezing, and will be heaved more or less by the frost. And if low joints are common the oscillation due to broken joints becomes objectionable.

The Minnesota & Northwestern is interesting, not only as a new line from Chicago to St. Paul, and as an element in disturbing the old traffic arrangements, but because of the vigor with which it has been launched and the intelligence and energy with which it is operated. We are glad, therefore, to be able to give some notes gathered in a recent trip over the road.

The line is a fairly favorable one as regards grades and curves. Especial pains have been taken to keep out of cutting, on account of snow, and this has increased the amount of fill, and in some cases made grades heavier. There are several rock cuts of considerable size. The rail is 60 lbs. per yard, laid with even joints, suspended. The ballast is generally gravel, but through and near the rock cuttings broken stone is used. The track is in remarkably fine condition for a new road. In fact, but for inevitable settling of the banks, it is in fine condition for an old road. At the stations, that is at average distances of about six miles, there are passing tracks 2,000 ft. long. The yards have all been so placed that all switching operations are carried on without breaking the main track. They are laid out on the "diagonal" system, with 1,200 feet between frogs; and their capacity may be increased for all probable future needs on the same simple and commodious plan.

At St. Paul the company has ample yard room for its freight terminals, and has established small but very complete and well-arranged shops. The tracks to its freight terminals there, as well as the draw-bridge over the Mississippi, are protected by interlocked signals and switches. The rolling-stock is all of the best class. The day coaches, built by Barney & Smith, are very handsome and complete. They are provided with lavatories, and are finished in mahogany, inside and out. They are carried on six-wheel trucks with Krupp steel-tired wheels. The company runs Mann sleeping cars as well as its own sleeping and buffet cars, these latter also built by Barney & Smith. Some of its last passenger engines are 53 tons, with 19 x 24 cylinders, and 69-in. drivers.

The company has shown a liberal and enterprising spirit in various ways. It has not only encouraged and aided the development of special industries and enterprises, but is taking intelligent measures to bring about the best relations



with its passengers and employés. At Elma, a division point, the company has built a club-house for the men. It is a pretty brick structure, heated by steam, and well lighted. It has reading and smoking-rooms, bath-rooms, with hot and cold water, and 26 small single bed-rooms. In the basement is a laundry. This house is turned over to the men for their control and use. The company heats and lights it, but the men pay the laundry expenses. A trainman coming in from his run can get a warm bath and sleep in a clean bed, and start out again sober, refreshed and self-respecting. If he has a few minutes for amusement he may find on the tables all the railroad papers, and many of the best weekly and monthly publications, and on the shelves is a considerable collection of books. Unless humanity is duller and more perverse than we think it, the moral and intellectual effects of that little club-house must be most excellent, and it ought to put money into the pockets of the corporation.

An experiment of more immediate interest to passengers is that of serving luncheon on the buffet cars at prices and of quality to invite the patronage of all who travel first-class. Coffee, for instance, is served at five cents a cup, and sandwiches and cold cuts at prices correspondingly low. It is said that even at these prices a buffet car is found to be directly profitable. It is now proposed to fit one with a small broiler, and serve chops and steaks as well as the articles ordinarily obtainable on a buffet car. It is hardly possible that these experiments will be profitable in themselves, and it is not likely that direct profit is expected, but it will be interesting to know the result of them in encouraging passenger travel over the road.

#### RAILROAD LAW—NOTES OF DECISIONS.

##### Powers, Liability and Regulation of Railroads.

In Vermont, the Supreme Court holds that when one person receives of one railroad and lessee of another, and both are operated by him together, the leased road is not receivership property; and an employé can maintain an action at law against him, without leave of the Court of Chancery, to recover for injuries resulting from the negligence of his servants in operating the leased road.<sup>1</sup>

In Massachusetts, where the terms of a lease by a railroad company, of a part of its track to another company, to be operated by the lessee, appeared to be sufficient effectually to bind the lessee to indemnify the lessor against loss, but did not state that the lessor should be exonerated from responsibility; and the making of the lease was ratified by the legislature by a statute which did not contain any express provision as to the liability of the lessor or its exemption therefrom. The Supreme Court holds that the lessee was not substituted for the lessor in any such sense as to relieve the latter from liability; and that therefore an action of tort for personal injuries received on the leased track operated by the lessee company was maintainable against the lessor company.<sup>2</sup>

In Ohio it is held by the Supreme Court that municipal corporation has not the power, by ordinance, to compel a railroad company to maintain, at a street crossing within the corporate limits, a watchman for the purpose of giving warning to passers-by of the approach of trains.<sup>3</sup>

In Virginia the Court of Appeals decides that a railroad company, chartered under the laws of Virginia, cannot, by the voluntary surrender of the possession, control, and operation of its road, by deed of trust, to trustees of its own selection, shift the responsibilities imposed upon it by law, nor relieve itself from liability for wrongs or injuries subsequently done to persons or to property in the negligent operation of its road.<sup>4</sup>

In Maine the Supreme Court lays it down that while the prospective wants and liabilities of a railroad corporation may be taken into account in ascertaining whether net profits have been earned from which the corporation can afford to declare a dividend, directors are not justified in refusing to declare a dividend to preferred stockholders from earnings on hand, merely because the corporation cannot pay all of its funded mortgage indebtedness at maturity if dividends be paid; other conditions are to be considered. The Court will compel a corporation to declare and pay dividends on preferred stock when the question becomes one more of right to be determined by the law than of discretion to be determined by the directors, and the directors refuse to perform their legal duty. In this case the railroad corporation owes nothing but a bonded mortgage debt of \$150,000, to mature in 1890; the common stock is \$350,400, and the preferred \$267,700; the road cost \$1,050,000; the earnings of the road have paid off an indebtedness of \$251,900, which entered into its construction, the reduction commencing in 1871, and terminating in 1885, leaving in the latter year \$22,412 cash assets on hand; the expenses of the corporation are trifling beyond the payment of \$9,000 annually as interest on the bonded debt; the road is under lease until 1921, at an assured rent of \$36,000 per year, the lessee running the road at its own risk and expense, and keeping it in repair and paying all taxes thereon; the corporation has the ability, upon the strength of the lease, or on the value of the road, to renew a portion of the debt, or all of it, upon advantageous terms; and the preference shareholders have been for many years deprived of dividends; to enable the corporation to consummate the payment of its debts. The Supreme Court holds that under these facts, the preferred stock is entitled to a full annual dividend from the balance of earnings remaining on hand at the expiration of the year 1885.<sup>5</sup>

##### Carriage of Goods and Injuries to Property.

In Georgia the Supreme Court holds that where a receipt for shipment given by a railroad company specified a bundle of bedding as the goods to be transported, and it did not appear that other articles contained in the bundle were mentioned or known to the company's agent, the company, in case of the loss of the bundle, is liable only for the value of the bedding.<sup>6</sup>

In North Carolina an oral agreement was made by a railroad company to furnish cars on a particular day to transport cattle from a point in North Carolina to Richmond, with knowledge of the shipper's purpose to have the cattle delivered at the destination in time for a particular market day. The company failed to have the necessary cars in readiness, and the shipment was delayed until a later day, when the cattle were sent, and a bill of lading then given, the form of which limited the liability of the company as to detention, measure of damages, etc., in consideration of a reduced rate of freight. The Supreme Court decides that the oral undertaking was not merged in the contract arising out of the bill of lading, and that the shipper was therefore entitled to damages consequent upon the detention.<sup>7</sup>

In Georgia, in an action against a railroad company for damages to stock carried by it, the defendant's evidence merely consisted of a showing, from the appearance of the car in which the stock had been carried, that the train had

not been derailed. No employé in charge of the train was produced to account for the injury. The Supreme Court decides that this evidence is not sufficient to overcome the statutory presumption of negligence from the happening of an injury.<sup>8</sup>

In Georgia, in an action brought against a railroad to recover damages for the continuance of a nuisance, by suffering polluted water to flow upon plaintiff's premises, the testimony showed that, by reason of ditches and an embankment on the lands of third persons over which defendant had no control, an increased quantity of polluted water flowed through a culvert and ditches constructed and dug on defendant's land to a pond on the premises of plaintiff. The Supreme Court rules that defendant, having in no way contributed to increase the flow, was not liable for the resulting damages.<sup>9</sup>

In Indiana the Supreme Court rules that where a railroad maintains a bridge in such a condition that animals may enter it from a public highway, the road is not securely fenced within the law. Courts will not assume that a railroad bridge abutting upon a highway may not reasonably be so constructed as to deter animals from entering thereon and yet be secure for the passage of engines and trains.<sup>10</sup>

In the same state running water interfered with the digging of a well by a railroad company, and they employed a man to furnish and superintend a portable engine to pump the water out of the way, so as to admit of the prosecution of the work. Neither the railroad company nor any of its employes had the right to run the engine or interfere in the manner of its running, or to direct its owner how or when it should be run. The Supreme Court holds that the person so contracted with was an independent contractor, and the railroad company was not responsible for injury resulting from his negligent conduct.<sup>11</sup>

##### Injuries to Passengers, Employees and Strangers.

In Virginia the Court of Appeals affirms a verdict in favor of a passenger who was injured by the starting of a train while he was endeavoring to get on board.<sup>12</sup>

The Supreme Court of South Carolina has had a new question presented to it for decision, namely, whether it is the duty of a conductor to assist a passenger to alight from the train, and it decides it in the negative. An old woman getting off a car was hurt, and the trial court instructed the jury that the conductor being at hand should have helped her, and his not doing so was an act of neglect. This the Supreme Court on appeal says is wrong. "I do not understand," says one of the Supreme Court judges, "that there is any legal duty resting upon the conductor to assist passengers in leaving the cars."<sup>13</sup>

In a Georgia case, the Supreme Court says: "Whether in a given case due diligence requires that a train should leave on schedule time, or whether persons upon it not as passengers should alight from it before the time of departure fixed by schedule, or whether when a train is starting or about to start a person passing in front of the engine should see to it that the train is not moving or about to move, are all questions of fact for the jury, and not for decision by the Court in its general charge. The Court undertook to instruct the jury that a train ought to leave on schedule time, and that the conductor ought not to delay its departure beyond schedule time in order to give persons an opportunity to get off. It moreover instructed the jury that ordinary diligence would require that a person passing in front of an engine in the act of starting, or about to start, should see to it that it was not starting or about to start. These were all questions for the jury, under the special circumstances. They are questions of fact, rather than of law."<sup>14</sup>

In Ohio a railroad sold and delivered a thousand-mile ticket to a purchaser who paid in money the usual rate to the class of travelers to which he belonged, and who secured it in ignorance of the following directions printed thereon: "Conductors will not honor this ticket unless properly stamped and signed by the purchaser, and will strictly enforce the above conditions." Instructions of the company to its ticket agents, and the uniform custom regulating the sale of such tickets, required that the purchasers sign certain conditions printed thereon before delivery to them. The ticket in question was delivered to the purchaser, and several times honored by the company's conductors without requiring him to sign the conditions. The Supreme Court holds that the company thereby waived such requirement, and its conductor was not justified in ejecting the purchaser from his car by reason of his refusal to sign the ticket, and to pay the usual fare in money for his proposed passage.<sup>15</sup>

In Georgia the Supreme Court says that the rule of liability of a railroad company for negligence is not the same in the case of an employé as in the case of a passenger. In the case of an employé no presumption of negligence on the part of the company arises from the accident alone as it does in the case of a passenger, but the plaintiff must at least show that the employé was using due care.<sup>16</sup>

In South Carolina, one whose regular employment was braking on freight trains was put upon a special passenger train for a night run. The night was cold and snow was falling, and the platforms of the cars became covered with ice. The air-brakes on the train were out of order. The brakeman knew this, and also that he was put on the run for that reason. He was thrown from the platform and killed while the train was running down a steep grade with reverse curves. The Supreme Court holds that the railroad company is not responsible.<sup>17</sup>

In Virginia, a brakeman in the employ of a railroad company, who, although a minor, was allowed by his father to find employment for himself, had his hand crushed by being caught between the dead-blocks while coupling cars. According to his own testimony, he thought the cars were coming too fast, and signaled to stop them, but although they did not stop, and he still thought that they were moving too fast, he stepped in between and attempted to make the coupling. He understood the construction of draw-heads and dead-blocks, and knew that it was dangerous to get the hand between the dead-blocks. The Supreme Court of Appeals rules that the plaintiff in accepting the employment assumed the risks incident to it, and that his injury resulted from such risks or his own negligence, and that the company was not responsible.<sup>18</sup>

In the same state where an employé engaged in coupling cars was injured by reason of the alleged defective condition of the bumper or draw-head, and the evidence showed that, shortly before the accident, he had uncoupled the same car, and that it was his duty to have known of the defect, if it existed, and to have reported it, and that it was his duty to observe the cars and couplings so as to determine, before attempting to couple them, what kind of a link to use, and by failing to observe the disparity in the height of the draw-heads he had used a straight link, the Court of Appeals holds that he was guilty of such contributory negligence as precluded recovery.<sup>19</sup>

In Indiana an employé sued for injuries received while coupling cars by hand. The railroad in defense set up the following notice, which had been given to all its employes: "Coupling cars by hand is dangerous and unnecessary. This work can be as effectually done by the use of a coupling-stick, which will be supplied to employes by yardmasters at \* \* \*. From this date the company will not assume any liability or pay any expense incurred by employes on account of injuries received in coupling cars." The Supreme Court holds that the receipt of this notice, and the employes' continuance in the

service of the company, made its terms part of the contract of employment, and a breach of duty by the employé to undertake to couple cars by hand; and the only obligation resting on the railroad company was that of providing cars that might safely be coupled by the use of a coupling-stick.<sup>20</sup>

In Illinois the Supreme Court rules that where, when the locomotive came to a certain place and the engineer stopped the train, it was his duty to go to the engine-house, and it was the duty of the car inspector, when the train was stopped, to go upon it and begin his work of inspection, such engineer and car inspector were not fellow servants engaged in a common service. The servants of the same master, to be co-employes so as to exempt the master from liability on account of injuries sustained by one resulting from the negligence of the other, must be directly co-operating with each other in a particular business, i. e., the same line of employment, or their usual duties must bring them into habitual association, so that they may exercise a mutual influence upon each other, promotive of proper caution.<sup>21</sup>

In Georgia a man walking on the track before daylight in the morning was struck and injured by a train. On the ground of his contributory negligence the Supreme Court sets aside a verdict in his favor.<sup>22</sup> In another case in the same state the railroad is held liable to the representatives of a pedestrian killed at a crossing.<sup>23</sup>

In Illinois the Supreme Court rules that a person approaching a railroad crossing when there is nothing apparent to warn him of danger, and at which he knows a flagman is stationed, whose duty it is to warn all persons of danger from running trains, is not required to look elsewhere than to the flagman.<sup>24</sup>

In the same state, the Supreme Court holds that where a person was about to pass over a railroad track in a city, in a carriage, and his horses were frightened by a train passing at a rate of speed prohibited by a city ordinance, and the carriage was overturned, and he was injured, a suit may be maintained for his benefit for the statutory penalty, although there was no actual collision.<sup>25</sup>

- <sup>1</sup> Lyman v. Cent. Vermont R. Co., 4 New Eng. Rep., 7'6.
- <sup>2</sup> Brasin v. Sumerville H. R. Co., 4 New Eng. R. p., 888.
- <sup>3</sup> Havens v. Pennsylvania Co., 10 West. Rep., 463.
- <sup>4</sup> N. Gleason v. Alexandria & F. R. Co., 3 S. E. Rep., 369.
- <sup>5</sup> Hazeltine v. B. & M. L. R. Co., 4 New Eng. R. p., 704.
- <sup>6</sup> Savannah, F. & W. R. Co. v. Collins, 3 S. E. Rep., 410.
- <sup>7</sup> Hamilton v. Western N. C. R. Co., 3 S. E. Rep., 169.
- <sup>8</sup> Columbus & W. R. Co. v. Kennedy, 3 S. E. Rep., 267.
- <sup>9</sup> Humberly v. Savannah F. & W. R. Co., 3 S. E. Rep., 274.
- <sup>10</sup> (In re), H. & I. R. Co. v. Jones, 9 West. Rep., 602.
- <sup>11</sup> Wabash, St. L. & P. R. Co. v. Farmer, 9 West. Rep., 621.
- <sup>12</sup> Norfolk & W. R. Co. v. Prior, 11 S. E. Rep., 165.
- <sup>13</sup> Sims v. South Carolina R. Co., 3 S. E. Rep., 301.
- <sup>14</sup> Harris v. Central R. Co., 3 S. E. Rep., 357.
- <sup>15</sup> Kent v. B. & O. R. Co., 10 West. Rep., 457.
- <sup>16</sup> East Tennessee, V. & G. R. Co. v. Mislov, 2 S. E. Rep., 541.
- <sup>17</sup> Atkins v. Atlanta & C. A. L. R. Co., 2 S. E. Rep., 819.
- <sup>18</sup> Norfolk & W. R. Co. v. Cottrill, 3 S. E. Rep., 123.
- <sup>19</sup> Norfolk & W. R. Co. v. Emmert, 3 S. E. Rep., 145.
- <sup>20</sup> Pennsylvania Co. v. Whitcomb, 9 West. Rep., 823.
- <sup>21</sup> Chicago & Alton R. Co. v. Hunt, 9 West. Rep., 785.
- <sup>22</sup> Central R. Co. v. Smith, 3 S. E. Rep., 367.
- <sup>23</sup> Richmond & D. R. Co. v. Howard, 3 S. E. Rep., 387.
- <sup>24</sup> Chicago, St. L. & P. R. Co., 9 West. Rep., 544.
- <sup>25</sup> Chicago & East Ill. R. Co. v. Tilton, 9 West. Rep., 740.

#### TECHNICAL.

##### Locomotive Building.

The Philadelphia & Reading has ordered 25 locomotives to be built by the Baldwin Locomotive Works, and will use them to haul freight and coal trains.

The Rogers Locomotive Works, of Paterson, N. J., have nearly completed 10 large Wooten passenger engines for the Union Pacific. The cylinders are 22 x 25, and the drivers 64 in. in diameter. These engines are intended for hauling the additional fast passenger trains which are to be put on over the steep grades of the mountain between Cheyenne and Ogden.

##### The Car Shops.

The Denver & Rio Grande has just let a contract to the Peninsula Car Co. for the construction of 800 new freight cars. The Pullman Co. is also building a large number of passenger coaches for this company, and 30 new locomotives are being built for it in the east.

It is reported that the Mann Boudoir Parlor Car Co. contemplates building large car works at some point in the South.

The Chattanooga Car & Foundry Co. has been awarded the contract for 50 flat cars for the Chattanooga, Rome & Columbus. The company is busy on an order of one hundred coal cars for the Nashville & Chattanooga Railroad.

The Indianapolis Car Works have contracted to build 300 cars for the Chicago, Burlington & Quincy, 60,000 pounds capacity. The car works have orders on hand for 2,700 cars.

##### Bridge Notes.

A new bridge is to be erected over the Manitoba & St. Louis tracks in Minneapolis, at a cost of \$40,000.

The Sheffer Bridge Co., of Pittsburgh, Pa., has received a contract for 30 girders, aggregating 1,500 tons, for use on the Pennsylvania Railroad.

The Wrought Iron Bridge Co., of Canton, O., has the contract for building a bridge over the Patapsco River, of 209 ft. in length with 18 ft. roadway.

The Ford syndicate, which possesses a charter for a bridge over the Mississippi River at Memphis, Tenn., announce that they will build the bridge with the aid of the Union Bridge Co., of New York, and promise to begin work within a month.

##### Manufacturing and Business.

The Thomson-Houston Electric Light Co. is erecting the electric plant at the Sub-Tropical Exposition in Jacksonville, Fla.

The Babcock & Wilcox Co., of New York, has received an order for a complete new plant of boilers for the electric light apparatus in the Opera House at Vienna, Austria.

The Davis Carbon Manufacturing Co., of East St. Louis, Ill., capital stock \$100,000, has been incorporated by John Henry Davis, Israel E. Russell and Simeon Lord.

The amount of business done in October by the Union Switch & Signal Co., of Pittsburgh, was the largest in its history, amounting to over \$110,000; that of the month before was almost as high, and they have every indication of a very prosperous year for 1888.

The New York Iron Roofing & Corrugating Co. report the closing of a contract with the Clyde Steamship Co. for the roofing and siding to be used on the new freight sheds on the East River pier. The building will be of iron throughout, 400 ft. in length and 30 ft. wide.

The Wainwright Manufacturing Co., of Boston, report the following shipments of their corrugated tube feel-water heaters during the month of November: 5 in Boston, 4 in New York City and 1 each to Biddeford and Skowhegan, Me.; Warren, Leominster, Bridgewater, Lynn and Lowell, Mass.; Bristol, Conn.; Providence, R. I.; East Liberty and Rending, Pa.; Amenia, N. Y.; West Brighton, S. I.; De Land, Fla.; and Japan. Shipments of corrugated tube expansion joints have recently been shipped to St. Louis and Kansas City, Mo.; Decatur, Ala.; Brooklyn and Dunkirk, N. Y.; Providence, R. I.; Winoski, Vt.; and Ware, Mass.

The Buffalo Illuminating Co., of Buffalo, N. Y., has been



incorporated. Capital stock, \$100,000. Daniel E. Bailey, C. E. Clark, T. H. Meyer, Jr., Henry R. Howland and E. G. S. Miller, incorporators.

The New York, Lake Erie & Western are experimenting with the electric light on a through train. Edison incandescent lamps are used, supplied from storage batteries on each car.

The Boston & Lockport Block Co., with factories at Boston, Mass., and Lockport, N. Y., has been organized to succeed the Bagnall & Loud Block Co., Boston, and the Penfield Block Co., Lockport, N. Y., the paid up capital of the company being \$275,000. The officers of the new company are: Ambrose S. Beverly, Lockport, N. Y., President; Edward O. Loud, Boston, Mass., Vice-President; Myron H. Tarbox, Lockport, N. Y., Secretary; Herbert Loud, Boston, Mass., Treasurer; Frank E. Fitz, Boston, Mass., Clerk. The factory management will be under the direction of Herbert Loud and Myron H. Tarbox.

#### Iron and Steel.

The Worcester Steel Works, of Worcester, have commenced active operations again, after their shut-down last month.

The Virginia, Tennessee & Carolina Iron & Steel Co., of Bristol, Tenn., has commenced improving its property, and, it is said, negotiating for the formation of a company to build a 100-ton furnace.

Three hundred employees of the Edgar Thomson Steel Works, at Braddock, Pa., have been discharged, owing to the present inactivity in the steel trade.

Mr. J. F. Bailey, of Philadelphia, has been appointed sole agent in the United States for the Landore Siemens Steel Co., Limited, of Landore, South Wales. Five thousand tons of steel was furnished by this company for the Poughkeepsie bridge.

The Scottsdale Sheet Iron Works, at Scottsdale, Pa., formerly owned by W. H. Everson & Co., will start up again this week. This plant has been idle for five months. The arrears have been paid to all workmen who had undisputed claims against the late firm.

The Miller Forge Co., Limited, of the Duquesne Forge, are making two iron shafts of very large size, their diameter being 25 in. They also have an order from John Roach & Sons for shafts, cranks, piston-rods, etc., for a large steamship.

The Johnstown Steel Street Railway Co. will not erect the extensive plant with which they have been credited. They will, however, build a rolling mill at Johnstown, Pa., 350 ft. long by 150 ft. wide, with a boiler house adjoining. The mill will be finished by next May. It will have a daily capacity of 300 tons.

The Standard Steel Casting Co., Thurlow, Pa., have commenced the construction of an addition to their works, 130 by 95 ft., and will put in a traveling crane of 30 tons capacity. The company will also build a new open-hearth steel furnace, which, with their present one of 10 tons, will enable them to handle very large castings.

The Eureka Cast Steel Co., of Chester, Pa., has contracted with the United States Mitis Co. for the right to manufacture wrought iron and steel castings by the Mitis process. The company will build at once a new plant under the direction of Peter Ostberg, of Stockholm, Sweden, and Mr. Bocklund, of the same place, will have charge of the work.

The Iowa Rolling Mill Co., of Burlington, Iowa, has been incorporated. Capital stock, \$70,000. Richard Brown, John H. Gear, M. C. Williams and J. W. Price incorporators.

The Central Iron Works and the Chesapeake Nail Works, of Harrisburg, Pa., shut down on Dec. 5, for one week, owing to overproduction.

The Andrews Brothers Co., of Hazleton, O., founders, has been incorporated. Capital stock, \$500,000. Chauncey H. Andrews, L. E. Cochran, James Neilson, H. W. Heedy and H. W. Calvin, incorporators.

The Pray Iron Works, of Minneapolis, Minn., has passed into the hands of Anderson, Douglass & Co. The owners propose to establish a company with stock to the amount of \$250,000. It is proposed to begin the erection of buildings in the spring, and it is thought that \$150,000 will be sufficient to provide buildings and start the works.

The largest lap-weld furnace, No. 2, in the pipe mill of the Reading Iron Works, at Reading, Pa., has been shut down for an indefinite period. The suspension is due to the dullness in the trade for heavy pipe. By the suspension the force of men thrown out of employment, with those already suspended, numbers about 175.

#### The Rail Market.

**Steel Rails.**—There have been Eastern sales during the week amounting to 30,000 tons, and the market is steady at \$32, that being the lowest figure, some holding out for better prices.

**Old Rails.**—Sales reported during the week comprise a 1,000 ton lot of double heads, a lot of 700 to 800 tons from an Eastern road, reported at \$22.50 on the line, and 250 tons from a Pennsylvania road at Youngstown, O. Tees may be quoted at \$22.

#### Car Heating and Lighting in Massachusetts.

The Massachusetts Railroad Commissioners have issued a circular calling upon the railroads for information in regard to their present methods of heating cars, with changes or prospective changes. It reads:

"The board, in accordance with a circular issued on the 25th of June, has received a statement as to the outfit at the beginning of the summer, and it now desires a statement, to be returned not later than Dec. 5, giving information upon the following points:

First—Present outfit, showing what changes have been made since the previous return.

Second—A statement as to the practical working of any system of heating by steam from the locomotive in use on your road, covering among other things the question of the relative economy and efficiency as compared with the old system of individual heaters or stoves.

Third—The form of steam-pipe coupler used and a statement as to its working, including suggestions as to the best method of securing uniformity of steam coupler.

Fourth—What further improvements in outfit for heating you intend to make during the coming winter? What during the coming summer?

Fifth—A description of such system or systems as you may have for lighting cars, stating the kind of lamps and oil used, the method of lighting by electricity, with an estimate of the relative cost of oil and electricity, if both are in use.

Sixth—A statement of such accidents, if any, as have happened on your road within the past five years, from the methods of lighting in use.

#### Car Heating Notes.

The experiments conducted by the Chicago, Milwaukee & St. Paul between Chicago and Minneapolis during the last cold snap, when the thermometer registered from 12 to 28 degrees below zero, have demonstrated that the system of steam heating adopted by that company for its passenger trains is a success, and, commencing Dec. 1, all through trains on this road will be provided, as rapidly as possible with steam heating apparatus on the passenger coaches. This company appears to deserve the credit of being the first to adopt a system of continuous heating on its through trains.

The method adopted has been devised by Mr. George Gibbs, Mechanical Engineer of the line.

The steam is taken direct from boiler of locomotive through a regulating valve, then passes through a reducing valve under the cab, which only allows low pressure steam to pass through the heating pipes and connections in cars. A direct line of pipe is laid under each car and brought up to the top and edge of platform, where hose connections and couplings are placed for passing from one car to another. This direct pipe is properly covered to prevent condensation, and is tapped by an upright pipe which communicates with radiator piping along sides in inside of car for the heating surface. The condensed water from the radiator pipes runs freely down the incline pipes, and is allowed to escape under the car by steam expansion traps.

An arrangement of indirect heating radiators enables the cars to be properly ventilated. The motion of the train forces a large current of heated fresh air into the cars. The method employed is very similar to that used in Loue heated by the indirect radiator system.

Some experiments have been made on the Connecticut River Railroad with a system of continuous steam heating devised by Mr. A. B. Harris. The cars are heated by hot water in connection with the Baker heater. The latter is used when the train is detached from the engine, but when running, hot water heated in a coil of pipes in the smoke box circulates throughout the train.

Mr. George C. Watrous, Superintendent of Motive Power Detroit, Lansing & Northern and Chicago & West Michigan roads, has devised a system of train heating which will be tried shortly on a train. Hot water from the boiler of the locomotive is forced through circulating pipes and returns again to the boiler, a Westinghouse air-pump with water piston being used for this purpose.

The coupler employed in the Westinghouse system of continuous heating is very similar to the brake coupler.

Mr. Edward Gold is trying a novel form of hose in connection with his system of heating. Strength is obtained by a complete hose of woven wire, while tightness is secured by a combination of rubber and canvas with the woven wire fabric.

A system of continuous heating invented by Mr. D. J. Timlin, Master Mechanic, and Mr. Q. B. Heidinger, conductor on the Illinois & St. Louis, is undergoing test on that line. A tank containing compressed gas is placed under the car and provides means for heating when the engine is detached. The car is also lighted by gas from the same tank.

The Pennycuik automatic coupler for continuous steam heating has been modified in some of the points described in our illustrated article on the eleven couplers in the issue of the *Railroad Gazette*, Dec. 2, 1887. The coupler is now placed higher than the pipe underneath the car, so that the water drains away from the coupler, and the materials forming the joints are now hardened steel and vulcanized, instead of brass and rubber.

#### Uniform Couplings for Continuous Heating.

Committees from various technical societies met in Buffalo, Nov. 30, to confer upon the continuous heating question. We have already announced the names of the delegates from the various societies. The only important action taken was a resolution declaring that flexibility of connections can be best secured by the use of rubber hose. It was agreed to meet in conference with the committee of railroad officers which was organized at the Astor House meeting, Nov. 16.

#### Burning Petroleum Under a Locomotive.

The Bullard system of burning petroleum is to be applied to a Boston & Albany locomotive, as it has given good results under the boiler of a stationary engine at the Springfield shops.

#### The Standard Freight Car Coupler.

A meeting of the general managers of all the roads terminating in Chicago was called Saturday, Nov. 26, to consider the car-coupler question. The result of the meeting was the appointment of a committee, consisting of Mr. E. T. Jeffery, General Manager of the Illinois Central; Mr. H. B. S. one, General Manager of the Chicago, Burlington & Quincy, and Mr. A. Kimball, Assistant to the President, Chicago, Rock Island & Pacific, to investigate fully the different couplers of the Master Car-Builders' type and to see what arrangements can be made for their use, and report to a subsequent meeting of the General Managers. It seemed to be thought that such arrangements should be made on a royalty basis.

#### New Passenger Locomotive.

Passenger engine No. 830, designed by Mr. A. J. Cromwell, Supt. Motive Power Baltimore & Ohio, has recently been turned out of the Mt. Clare shops at Baltimore, and placed in service. The performances of the new engine have fully met the expectation of her designer, and he has been the recipient of many congratulations from the officials of the traffic and transportation departments of the road. No. 830 hauled express train No. 3, consisting of three sleeping cars, three coaches, two baggage cars, one express car and one postal car, from Baltimore to Martinsburg in 2 hours and 56 minutes, making four stops at stations. The distance is 114 miles, and the running time was, therefore, made at the rate of 39 miles per hour, an exceedingly high rate of speed to maintain with so large a train and over such grades as intervene between Baltimore and Martinsburg. The same engine took the limited express No. 5, consisting of one sleeping car, two coaches, one baggage and one postal car, from Piedmont to Altamont, 17 miles, in 43½ minutes, and the same train up Cheat River grade from a dead stop at Rowlesburg, 7½ miles in 15 minutes. The distances named are all up grade, the former averaging 117 ft. and the latter 105 ft. to the mile. Engine 830 has four driving wheels, 66 in. dia.; cylinders, 19 x 24; telescopic boiler, 53 in. dia. at smoke box with 8 in. wagon top; 174 flues 12 ft. long and 2½ in. dia.; fire-box, 117 in. long by 34 in. wide, inside measurement; gross weight, with four gauges of water and ready for service, 102,000 lbs.; weight on drivers 70,000 lbs.

#### The Timms Coupler—M. C. B. Type.

Mr. Timms, inventor of a new Janney type coupler, gave a test of his device at the Columbus shops of the Pan Handle road last Saturday. J. L. Copeland, Master Car-Builders, and other officials of the road were present. The draw-bars were in position on two standard freight cars. The following tests were made in a satisfactory manner:

Coupling with one knuckle open; coupling on curve; coupling with Janney. Mr. Timms says that he will make the head of gray iron, believing that it will be sufficiently strong when so made. He will be at Washington, Dec. 13, for a competitive test.

#### Car Spring Manufacturers' Meeting.

The car spring manufacturers met at Pittsburgh, Pa., last week, and were in session for three days. The following firms were represented: The National Car Spring Co., New York City; the Chicago Tire & Spring Works, Chicago, Ill.; the Detroit Spring Co., Detroit, Mich.; the Atkinson Car Spring Co., Chicago, Ill.; the Pickering Spring Co., Philadelphia, Pa.; the Cliff & Rigby Spring Co., Oswego, N. Y.; the Leigh Valley Spring Co., Catsaqua, Pa.; the Compton Spring Co., Compton, N. J.; the Davis Spring Works, Wilmington, Del.; the Faris Spring Co., Bridgeport, Conn.; the A. French Spring Co., Pittsburgh, Pa.; Anderson, Du Puy & Co., Pittsburgh, Pa.; Miller,

Metcalf & Parkin, Pittsburgh, Pa.; the Diamond Sate Spring Co., Philadelphia, Pa.; Charles Scott Spring Works, Philadelphia, Pa.; and the Richard Voss Spring Works, of Newark, N. J. An organization was effected to be known as the Railway Spring Manufacturers' Association of the United States. It was decided to make a general advance throughout the lists of from 15 to 25 per cent. An agreement was also made not to cut prices, under penalty of a heavy fine. As soon as the new list is prepared it will go into effect immediately. The following officers were elected by the Association: President, Benjamin F. Atha, of Newark, N. J.; Vice-President, Joel Farist, of Bridgeport, Conn.; Secretary, Edward Guibert, of New York City; Executive Committee, Charles Scott, of Philadelphia; Aaron French, of Pittsburgh, and A. Delano, of Detroit, Mich. Another meeting of the Association will be held early in January in New York City.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

Meetings of the stockholders of railroad companies will be held as follows:

*Boston & Albany*, annual meeting, Boston, Dec. 14.  
*Fort Worth & Denver City*, annual meeting, at the office, Fort Worth, Tex., Dec. 13.

*Housatonic*, annual meeting, at the office, Bridgeport, Conn., Dec. 16.

*Georgia Pacific*, annual meeting, Birmingham, Ala., Dec. 21.

*New York, New Haven & Hartford*, at the office, New Haven, Conn., Dec. 21.

*Rome, Watertown & Ogdensburg*, annual meeting, at the office, New York, Dec. 28.

*Richmond & West Point Terminal*, annual meeting, at Richmond, Va., Dec. 13.

### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Old Colony*, \$3.50 per share, payable Jan. 2.

### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The *New England Railway Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month.

The *Boston Society of Civil Engineers* holds its regular monthly meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m. on the third Wednesday of each month.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, on the third Thursday of each month.

The *Western Railway Club* meets in Chicago the third Wednesday in each month.

The *American Society of Mechanical Engineers*, eighth annual meeting, Philadelphia, Pa., Nov. 28 to Dec. 2, at the Continental Hotel.

The *American Society of Civil Engineers* meets at its rooms, 127 East Twenty-third street, New York, the first and third Wednesday of each month.

The *Engineers' Club of St. Louis* meets the first and third Wednesday of each month till June.

The *Central Railway Club* meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

### New England Railroad Club.

The regular monthly meeting of the New England Railroad Club will be held in the rooms at the Boston & Albany passenger station in Boston at 7:30 p. m. on Dec. 14. The subject for discussion will be "Continuous Brakes for Freight Trains."

### The Engineers' Club of Philadelphia.

This club has issued invitations for a reception on the 17th inst. to celebrate the decennial anniversary of the organization of the club.

### American Society of Civil Engineers.

At the meeting of the society Wednesday evening, Dec. 7, the subject of the proposed resolution, fixing the entrance fee and annual dues for Associate Members, and for the proposed grade of "Students," was brought up, and after some discussion was adopted. The resolution is as follows:

**Resolved**, In the event of the Society adopting amendments to the constitution creating the grades of associate member and students of the society, that the entrance fee and annual dues of associate members shall be the same as established for associates; for students no entrance fee shall be required, and the annual dues shall be for resident students, ten dollars, and for non-resident students, six dollars per annum.

The author's closing discussion on the paper on "Steel: Some of Its Properties; Its Use in Structures and in Heavy Guns," by Wm. Metcalf, M. Am. Soc. C. E., previously presented before the Society, was read by the Secretary.

In this closing discussion Mr. Metcalf remarked that had he known how far the arrangements of the government had progressed in relation to its new guns, he probably would not have touched upon the gun question, but when the statement had been made in foreign countries that no good guns could be made in America, it would make any good American rise and "talk back." That, so far as he was concerned, he would say, give the Ordnance Department all the money they wanted, and he himself would still stick to his opinion that the way to make big guns is to cast them. Mr. Metcalf also presented some very interesting data in relation to the crystallization of steel, hardened at different temperatures.

This paper, with the entire discussion, will appear in the June number of the *Transactions of the Society*, now in press.

The Secretary also read a short paper, giving some data as to the protection of piles from Limnoria and teredo in San Francisco Bay, collected by Mr. Marsden Manson, M. Am. Soc. C. E.

The result of these investigations seemed to show that the various devices used for protection against the teredo navalis, where the bark had been removed in order to apply them, proved in reality to have been less of a protection than the bark alone would have been. The Secretary exhibited some specimens of wood that had been subjected to the ravages of the teredo, one specimen taken from Charleston harbor and another from New York harbor, and also some specimens of the teredo itself, preserved in alcohol.

In the discussion of the subject, referring to the treatment of the wood with dead oil, the point was made that the quality of the oil had very much to do with the efficacy of the treatment, and that possibly many of the failures in this country were due to the fact that the oil had been of inferior quality, for instance, to that used in England.

Mr. J. F. Striedinger, member of the Society, who has recently returned from the United States of Colombia, said that in South America they have a kind of wood that they



call iron wood that they have used for piles, and claim that it is very good. It is a wood of a peculiar character and very hard, and the worms do not seem to attack it.

Mr. Worthen suggested that, inasmuch as the worms would not work in wood exposed to sewage water, that might be named among the protectives.

A member stated that the condition most favorable for the destructive work of the worms was sudden changes of temperature, from hot to cold and then continuous warmer weather.

After some further discussion the meeting adjourned.

The following elections were announced:

**Members:** Tucker Carrington Eggleston, Charles Edward Newham, Henry Bowman Seaman.

**Juniors:** William Pierson Field, Robert Van Arsdale Norris.

#### PERSONAL.

—Lionel A. Sheldon, one of the Receivers of the Texas & Pacific, has resigned his position.

—J. M. Miller has resigned the position of General Passenger Agent of the Bellair, Zanesville & Cincinnati.

—George A. Hoyt, President of the Pennsylvania Coal Co., died suddenly on Dec. 4, at the age of 70 years.

—Robert Curtis, Master Mechanic of the Pittsburgh, Chicago & St. Louis, died in Columbus, O., on Dec. 8, at the age of 52 years. He began his connection with the company in 1860 as General Foreman of the shops in Columbus. He was shortly afterwards made Master Mechanic, which position he has since held.

—Gen. Zenas C. Priest, Superintendent of the Eastern Division of the New York Central & Hudson River road, died at his home in Little Falls, N. Y., on Dec. 4, aged 81 years. Gen. Priest was born in Fairfield, Herkimer County, N. Y. At the age of 15 he was a blacksmith. Three years later he became a "commercial traveler." When he was 23 he was captain of a passenger and freight canal boat on what was known as the New York & Ohio line. In the same year he was married and soon afterwards settled at Little Falls. His first railroad experience was as an appraiser. In 1836 he was a conductor, and subsequently became a trackmaster. In 1840 he was given general charge of the Utica & Syracuse road, and was Superintendent for 7 years. His jurisdiction was increased in 1853, when the Utica & Schenectady and Utica & Syracuse roads were consolidated. Albany, Troy and the Athens branch were afterward added to his division, and for many years before his death Gen. Priest had over 5,000 men in his command, and the only man who had been in the employ of the Utica & Schenectady road in 1836, and remained in the employ of the New York Central in 1887, was Gen. Priest. The cause of his death was pneumonia.

—Mr. Henry Kuhn, who has just resigned the position of Master Mechanic of the Richmond, Fredericksburg & Potomac, had been in the service of the road fifty years, having served his apprenticeship elsewhere before that. On his retirement he was presented by some of his subordinates with a handsome cane. The spokesman of the occasion was Major E. T. D. Myers, General Superintendent of the road, who made a very happy little speech, in which he called attention to the fact that the cane would be chiefly ornamental, for the reason that the recipient had still a good share of backbone, both physical and moral. He referred to the marvelous progress that has been made in art and science since the "gaudy little cab-less, link-motion-less, air-brake-less, injector-less engine" of a half century ago made its tottering way over tracks consisting of "a hoop tacked to a lath," and voiced the sentiment of those present that the venerable officer had kept well at the head of the procession. He had supervised the work of the swarthy iron monsters of today with the same vigilance and skill, the same resolute honesty that he exercised in the management of the pigmies of his early days.

#### ELECTIONS AND APPOINTMENTS.

**Alabama Great Northwestern.**—The company has been organized with W. T. Joseph as President; J. W. Woolfolk, Vice-President and General Manager and W. G. Hutcheson, Secretary and Treasurer.

**Arkansas & Louisiana.**—Dr. W. P. Hart, of Washington, Ark., has been appointed Receiver of the company.

**Atlantic & Western.**—The following men have organized this company in Florida: E. R. Chapman, Jno. G. Moore, Samuel Thomas, Calvin S. Brice, H. W. Cannon, and Edward Tuck, of New York, and Dexter Hunter, of Jacksonville.

**Baltimore & Ohio.**—B. E. Peddicord has been appointed General Baggage Agent, with office at Baltimore.

**Chicago, Burlington & Quincy.**—M. B. Edwards has been appointed Acting General Agent of the company at Hannibal, Mo., in place of J. E. Ferree, the General Agent, who is not expected to live.

**Chicago & Eastern Illinois.**—The company was reorganized this week by the election of the following officers: H. H. Porter, President; O. S. Lyford and George C. Kimball, Vice-Presidents; H. A. Rubidge, Secretary, and C. W. Hillard, Treasurer. The Executive Committee is composed of H. H. Porter, Roswell P. Flower, Benjamin Brewster, Heber R. Bishop and H. H. Stevens.

**Chicago, Milwaukee & St. Paul.**—James G. Everest has been appointed General Traveling Passenger Agent, with headquarters at Chicago.

**Cincinnati, Indianapolis, St. Louis & Chicago.**—B. E. Hand has been appointed Division Freight Agent, with headquarters at Chicago.

**Fremont, Elkhorn & Missouri Valley.**—W. N. Babcock has been appointed General Agent; headquarters at Omaha.

**Georgia Company.**—The directors of this North Carolina company are: H. B. Hollins, who is also President; Emanuel Lehman, Alfred Sully, E. E. Dennison, of Philadelphia; Isaac L. Rice, August Belmont, Jr.; John H. Inman, Gustav E. Kissell, Mayer Lehman and James Swan.

**Georgia Midland.**—G. Gunby Jordan has been elected General Manager.

**Georgia Terminal.**—The incorporators are: Evan P. Howell, S. M. Inman and Henry Jackson, of Atlanta; John H. Inman, Samuel Thomas, Calvin S. Brice and T. M. Logan, of New York.

**Kansas City, Fort Scott & Gulf.**—Clifton Jones has been appointed Traveling Freight Agent, headquarters at Montgomery, Ala. John Sargent has been appointed Chief Clerk.

**Kansas, Nebraska & Decatur.**—The incorporators of this Nebraska company are: Arthur W. Dale, Charles S. Wilson, Frederick H. Plummer, Lewis E. Walker, E. E. McClarkle, John S. Walker, and William J. Connors.

**Lake Erie & Western.**—George F. Baker has been elected a director to fill a vacancy in the board.

**Lehigh & Hudson River.**—The former officers and directors were re-elected this week.

**Mobile & Ohio.**—Paul Gruber has been appointed General Agent at Kansas City, Mo.

**New York, Lake Erie & Western.**—W. B. Coffin has been appointed Superintendent of the Susquehanna Division, vice A. M. Tucker, resigned. E. F. Knibloe succeeds Mr. Coffin as Superintendent of the Western Division. C. W. Merrick has been appointed Superintendent of the new Bradford Division, from Carrollton, N. Y., to Johnsbury, Pa.

A. E. Clark has been appointed Division Passenger Agent, in charge of the Mahoning Division, including the Niles & Lisbon branch.

E. B. Sheffer has been appointed Purchasing Agent, vice W. G. Tuller, resigned.

**Omaha & Mexican Air Line.**—The directors of this Kansas company are W. F. Cleveland, Harland, Ia.; W. B. McGorisk, of Des Moines, Ia.; C. C. Free, Charles Coe, George Getty and Thompson Overton, of Syracuse, Kansas.

**Peoria & Michigan.**—The directors of this new Illinois company are E. H. Waldron, O. A. Hazlett, L. M. Kane, A. S. Osgood, and John Robb, all of Chicago.

**Pittsburgh & Connellsville.**—At the annual meeting this week the following were elected officers of the road, which is the Pittsburgh Division of the Baltimore & Ohio: President, Samuel Spencer, Baltimore; Secretary, Treasurer and Auditor, J. B. Washington, Pittsburgh; directors, Robert Garrett, Mendes Cohen, Gen. Charles Webb, F. H. Burns, Samuel Spencer, of Baltimore; W. H. Koontz, of Somerset, Pa.; John D. Scully, Gen. L. C. Fitzhugh, George A. Berry, Thomas W. King, of Pittsburgh.

**Southern Railway Construction & Improvement Co.**—The incorporators of this company are: Wesley R. Crumpton, Homer C. Hartman and Wm. R. Church, of Chicago.

**Stockton & Tulare.**—The directors of this California company are Leland Stanford, Charles F. Crocker, Timothy Hopkins, W. V. Huntington and W. E. Brown.

**Transcontinental Association.**—J. S. Leeds has been appointed Chairman. The headquarters of the organization is to be at Denver, Col.

**Wabash Western.**—Sumner Hopkins has been appointed Commercial Agent at Chicago, vice B. F. R. Clark, resigned.

**Wisconsin Central.**—W. A. Gardner has been appointed Superintendent of the Chicago, Milwaukee & Eastern Division, vice F. A. Merrill, resigned.

#### OLD AND NEW ROADS.

**Arizona Mineral Belt.**—The road, so far as completed, 36 miles, will be operated this winter by the Arizona Lumber Co. The management hope to adjust the difficulty with the Atlantic & Pacific by next spring so as to go ahead with the construction, and equip and operate the road as originally planned.

**Atchison, Topeka & Santa Fe.**—The extension from Atchison, Kan., to St. Joseph, Mo., was completed this week.

Only about \$2,000,000 remains to be paid on the stock subscriptions of the company, the remainder having been anticipated. Up to the present time the Chicago terminal facilities have cost about \$3,000,000, and the final cost will probably reach about \$5,000,000. They will be completed without any further issue of stock.

**Atlantic & Gulf.**—A survey is now out on this road, which is projected to run from Jacksonville, Fla., to Naples, on the Gulf coast, about 300 miles. New York and Boston capitalists are behind the scheme, though no names have been given. The financial backing is said to be strong. The road will be of standard gauge.

**Atlantic & Western.**—This company has organized in Florida to take charge of the Blue Springs road, with the intention of soon extending the latter to Tavares, about 50 miles westward. The Blue Springs is a small Florida road now in the hands of a receiver.

**Boston & Quebec Air Line.**—This projected road, which was to have been built from Skowhegan, Me., to a junction with the International at Jackman, has been abandoned, owing, it is said, to the opposition of the Somerset Railroad Co.

**Buena Vista & Ellaville.**—This road was completed last week from Americus to La Crosse, Ga. The road is to be extended from Buena Vista to Columbus, but it is not stated when the work will begin.

**Buffalo, New York & Philadelphia.**—The court at Pittsburgh this week reversed a decision made by a Master in this case of the New York & Cleveland Gas Coal Co. The railroad had agreed to carry the coal of the company at an agreed rate, and if the price of mining advanced the railroad was to allow a reduction corresponding to the increased expense. The Master decided against the coal company. The Court holds that the freight reduction is consistent and must be allowed.

**Burlington & Missouri River.**—The Cheyenne (Wyo.) extension leaving the main line at Holdrege, Neb., has been completed to the former city.

**Canada & St. Louis.**—This company has become incorporated in Goshen, Ind. Capital stock, \$2,500,000. W. L. Stonex is one of the incorporators.

**Central Massachusetts.**—The road will be opened to Northampton, Mass., on Dec. 18. It connects there with the Connecticut River and New York, New Haven & Hartford, and at Belchertown will have a junction with the New London Northern. The line runs parallel with the Boston & Albany from Barre to Ware, and with the New London Northern from Belchertown to Amherst.

**Chateaugay.**—The extension from Loon Lake in the Adirondack Mountains, N. Y., to Saranac Lake, has been completed, and regular trains are now running.

**Chicago & Eastern Illinois.**—The company has filed a mortgage on its property and franchises for \$8,000,000, in favor of the Central Trust Co., of New York.

**Chicago, Milwaukee & St. Paul.**—It is generally believed that the company will extend its line next season from Tomahawk Lake to L'Anse, Mich., a distance of 90 miles.

**Chicago & Northwestern.**—The work of extending the Wyoming Central division from Douglas, Wyo., has been completed. The end of the track is at Wolcott, a mile west of the new town of Glenrock.

**Chicago, Rock Island & Pacific.**—A large force of men and 2,000 teams are engaged on the grading of the Pacific coast extension in northeastern New Mexico. The line leaves Trinidad, Col., some 60 miles north, but will probably build a branch to the coal fields in the neighborhood.

**Chicago, St. Paul & Kansas City.**—On Dec. 7 the Minnesota & Northwestern road was sold and transferred to

this company. The entire Stickney system will hereafter be called by the above title.

**Chicago, Santa Fe & California.**—The Illinois Canal Commissioners will allow this company right of way along the canal in Chicago. The company agrees to build three or four substantial bridges at a grade high enough to admit of the passage of boats without a draw.

Tracklaying is completed in Illinois, and will be finished in Missouri within a few days. The road will be turned over to the operating department towards the last of this month.

The track was completed over the bridge across the Mississippi at Fort Madison, Ia., on Dec. 7. Regular trains will begin running between Chicago and Fort Madison on Dec. 19.

**Cincinnati, Indianapolis, St. Louis & Chicago.**—President Ingalls has proposed to the management of the Cincinnati, Wabash & Michigan to bear part of the expense in building a line between Rushville and Anderson, Ind., connecting the two roads.

**Columbus & Maysville.**—The section of this road between Hillsboro and Sardinia, O., is now being changed to standard gauge.

**Connecticut Central.**—The decree of foreclosure was granted last week. The road was turned over to the New York and New England on Dec. 8.

**Davenport, Iowa & Dakota.**—Judge E. H. Williams, of Clayton County, Ia., has the contract for grading and trestling 10 miles of this road.

**Dayton, Fort Wayne & Chicago.**—Petitions have been filed in Dayton, O., asking that this road be placed in the hands of a Receiver. C. J. Heinsheimer, a New York bondholder, and Thierz M. Arnold bring the suits, the latter asking the payment of \$25,000, the amount promised to be paid by H. S. Ives & Co. when they bought from her the stock of the Dayton Division of the Toledo, Cincinnati & St. Louis, which was consolidated with the Dayton & Chicago, thus forming the Dayton, Fort Wayne & Chicago.

The Cincinnati, Hamilton & Dayton, which is made a party in Heinsheimer's suit, has filed a cross petition admitting to be true all which Heinsheimer alleges, and also asks for the appointment of a Receiver. The Cincinnati, Hamilton & Dayton charges that Ives and Stayner obtained possession of the branches which constitute the Dayton, Fort Wayne & Chicago road and consolidated them, with about \$1,000,000 which they appropriated without authority from the funds of the Cincinnati, Hamilton & Dayton. Six hundred thousand dollars was used in the purchase of the Dayton & Ironton and about \$300,000 in the purchase of the Dayton & Chicago. Ives then formed a construction company composed of Ives, Stayner and their clerks, and entered into a contract with the Dayton & Ironton for the completion of the line, and under it spent large sums of money, all of which belonged to the Cincinnati, Hamilton & Dayton road, and was appropriated without the latter's knowledge or consent. There is now due the construction company about \$1,000,000, and the Cincinnati, Hamilton & Dayton claims that it is entitled in equity to the payment of this entire sum.

**Delaware Bay & Cape May.**—Vice-Chancellor Bird, of New Jersey, has filed an opinion that a railroad must run in winter as well as summer. He was appealed to to compel the above named company to operate its short line after the summer season closed. If this is not done a receiver will be appointed.

**Delaware River.**—The company will extend its line from Penn's Grove to Pennsville, N. J., at an expense of \$100,000. E. H. Greene, of Pedrickton, N. J., is the Superintendent.

**Flint & Pere Marquette.**—The State Attorney of Michigan has begun suit against this company, the Jackson, Lansing & Saginaw and the Grand Rapids & Indiana companies to recover to the state 180,000 acres of land valued at \$2,000,000.

**Georgia Company.**—This company has been organized under the laws of North Carolina for the purpose of holding and guaranteeing the bonds of any railroad in the state or adjoining states, and to operate railroads in the same. The new company holds as assets \$4,000,000 stock of the Central Railroad & Banking Co. of Georgia, and \$400,000 cash capital paid in.

**Georgia Midland.**—The road from Columbus to McDonough, Ga., was turned over by the construction company to the directors last week.

**Georgia Terminal.**—Incorporated in Atlanta, Ga., to build a road 20 miles in length.

**Grand Trunk.**—The company will soon build a short line from Watford, Ont., on the London & Sarnia branch, to Glencoe, the western terminus of the Air Line, with the view of running Point Edward freight over the Air Line to Buffalo.

Some 30,000 tons of coal belonging to this company at Fort Edward, Ont., caught fire on Dec. 7 and was totally destroyed.

**Gulf & Ship Island.**—About 60 miles of this road, on its Northern Division from Middleton, Tenn., to Pontotoc, Miss., is completed, and the company expects to have the 77 miles from Gulfport to Hattiesburg finished by Jan. 1. The total length of this road will be 350 miles.

**Houston, East & West Texas.**—The Union Trust Co., of New York, has filed a petition in Houston, Tex., against the Receiver of this road, claiming a prior lien on all the property as trustee under two mortgages. Default in payment of the bonded interest is set up and a decree is prayed for ordering the sale of the road.

**Houston & Texas Central.**—It is stated that C. P. Huntington and Mrs. Hetty Green have practically agreed on the reorganization of this company, and the amended plan will be made public within a few days.

**Indianapolis, Decatur & Springfield.**—Negotiations for the purchase of this road by the Mackey syndicate have all fallen through. Satisfactory arrangements as to the manner of paying for the road could not be agreed upon.

**Kansas & Arkansas.**—Tracklaying is being rapidly carried on from Van Buren, Ark., to Fort Gibson, I. T. About 75 miles of track are yet to be laid, and this is expected to be finished by March. The road crosses the Missouri, Kansas & Texas in the Indian Territory and connects with the Little Rock & Fort Smith.

**Kansas, Nebraska & Decatur.**—Articles of incorporation have been filed in Nebraska. The company proposes building a road from the town of Claffin on the southern boundary line of the state northward through the counties of Jefferson, Gage, Johnson, Otoe, Cass, Lancaster, Sarpy, Douglas, Saunders, Dodge, Washington and Burt to a point in the last county at or near the town of Decatur. The capital stock is fixed at \$3,000,000.

**Lake Shore & Michigan Southern.**—There is a report that the Vanderbilts will build a road across Indiana parallel with the above named line. The new construction will



begin at Fayette, Ind., the terminus of the Chicago & Canada Southern, which is controlled by the Lake Shore. The former company holds the right of way and has part of the distance graded between Fayette and Bayletown, a suburb of Chicago, 190 miles. The new road will be from one to two miles south of the Lake Shore. It is said that work will begin early next spring. It is proposed to use the line only for through freight trains, turning all the passenger and local freight traffic on to the Lake Shore.

**Lehigh Valley.**—Surveys are now being made for a route between Sayre, Pa., and Geneva, N. Y., more direct than the Geneva, Ithaca & Sayre.

**Little Rock & Alexandria.**—President W. B. Johnson announces that all contracts for building the road, bridges, etc., will be let by Jan. 1, and work will then be commenced. The road is intended to run from Little Rock, Ark., to Alexandria, La.

**Louisville & Nashville.**—The company this week assumed control of its Clarksville & Princeton division. This was a narrow gauge line known as the Indiana, Alabama & Texas, and running from Clarksville, Tenn., to Newstead, Ky., 30 miles. It has been changed to standard gauge and extended to Princeton, Ky., where it connects with the Ohio Valley and Chesapeake, Ohio & Southwestern. The work of laying the new heavy steel rails between Birmingham and Montgomery, Ala., has been completed.

**Louisville, New Orleans & Texas.**—The company has bought the West Feliciana road, extending from Bayou Sara, La., to Woodville, Miss., 25½ miles. The price paid was \$150,000.

**Manhattan.**—The company has decided to issue a new blanket mortgage of \$150,000, at 5 per cent., to take up the present 7 per cent. bonds, buy additional real estate and make improvements. Drexel, Morgan & Co. have taken \$2,000,000 of this amount to be delivered on Jan. 1.

The road has established a school of telegraphy at Chatham Square, New York City, for those employees who wish to qualify themselves in this branch of the service for promotion to the position of station agent. Applicants must be under 24 years of age.

**Marietta, Columbus & Lake Erie.**—The company has filed a mortgage for \$2,000,000 in favor of the Farmers' Loan and Trust Company, of New York.

**Mexican Central.**—This company and the International have arranged amicable terms for an interchange of traffic, and will proceed to act in harmony.

**Minnesota & Northwestern.**—President Stickney says that the Freeport and Dubuque line will be ready to operate on Jan. 15, giving this company its own road through from Chicago to St. Paul. He also says that an order has been given for 1,500 additional freight cars and that he expects to have his road completed to St. Joseph, Mo., early next year.

**Missouri Pacific.**—Track was laid into Pueblo, Col., last week. This will be the present western terminus of the road.

Work has been stopped on the Dallas and Waco extension in Texas.

Geo. Gould was in conference with President Moffatt of the Denver & Rio Grande this week in Chicago, on the subject of securing a transcontinental connection. There are rumors that the Denver & Rio Grande may be purchased and the proposed Salt Lake & Los Angeles built in the interest of the Missouri Pacific.

**Nashville, Chattanooga & St. Louis.**—On the Bon Air extension from Sparta, Tenn., to the Bon Air coal mines, 6 miles, tracklaying is in progress and will be completed by Jan. 1. The 37 miles of road from Bridgeport to Dunlap, Tenn., will be in operation in a few days.

**Nashville & Florence.**—The road is nearing completion. Tracklaying has commenced at Florence, Ala., and only a gap of 20 miles remains to be filled. Trains will be running within 60 days.

**Nashville & Knoxville.**—Davis & Canty, of Lebanon, Tenn., have the contract to complete the 14 miles of work east of Lebanon.

**New Roads.**—A syndicate of New York capitalists, headed by Heman Clark, the aqueduct contractor, have presented a proposition to the authorities to enter upon the construction of a railroad bridge across the Ohio River, at Wheeling, W. Va., and also to construct 41 miles of railroad between Bowerstown, O., and Wheeling, thus bringing three Northeastern Ohio lines into Wheeling. The terminal facilities inside the corporation limits of Wheeling will include a costly tunnel under a portion of the city and a large amount of terminal tracks. The amount of money called for will be something like \$3,000,000, of which Wheeling is to furnish \$300,000. The syndicate makes the proposition in response to overtures of a committee representing the Board of County Commissioners, the City Council and the Chamber of Commerce.

A construction company is being formed to build a road from Justin, Ind. Ter., to Decatur, Tex., 20 miles.

**New York, Lake Erie & Western.**—The company is double tracking the road between Salamanca and Carrollton, N. Y., on the Western Division.

The company is in the market for 1,000 freight, 500 flat and 500 box cars.

**New York & New England.**—The terms of the lease to this company of the Milford, Franklin & Providence road extending from Franklin to Bellingham, Mass., and the Milford & Woonsocket road, extending from Bellingham to Ashland, forming in all a line of 20 miles in length, are for 99 years from Oct. 1, 1887, no rental being paid for the first year, the net earnings to be applied to improvements. After the first year a rental equal to 25 per cent. of the aggregate gross earnings of both lines is to be paid to the two companies in specified proportions.

**Norfolk & Western.**—The company gives notice to the holders of the first preferred 8 per cent. and second preferred 6 per cent. consolidated mortgage bonds of the South Side Railroad Co. of Virginia falling due Jan. 1, 1888, that they will have the option until that date of extending their bonds until Jan. 1, 1890, with interest in the meantime payable semi-annually at the rate of 5 per cent. Bonds not so extended on or before Jan. 1, 1888, will be purchased at par at maturity.

**Northern Central.**—An answer has been filed to the suit brought by this company against the heirs of W. H. Vanderbilt, to compel them to carry out a contract made by Mr. Vanderbilt to sell to the Northern Central 60 per cent. of the stock of the Beech Creek, Clearfield & Southwestern, of whose stock he owned 50 per cent. The latter road has since been sold by the sheriff to the Vanderbilt heirs. They claim that if compelled to carry out the contract, which was not signed, it would be unjust, in view of the fact that proceedings are pending in the Supreme Court of Pennsylvania to prevent the sale.

**Ohio & Mississippi.**—The machine shops of the Western Division are to be removed from Vincennes to Washington, Ind.

**Old Colony.**—The Brockton branch from Stoughton to Brockton, Mass., will be finished and ready for business in January.

**Omaha & Mexican Air Line.**—Chartered in Kansas to build a road from Omaha, Neb., southwestward through the counties of Jewell, Smith, Phillips, Rooks, Graham, Frigo, Lane, Gove, Scott, Wichita and Hamilton, in Kansas, to El Paso, Tex., thence to the City of Mexico. Capital stock, \$10,000,000. The principal offices are to be at Syracuse, Kan., and Omaha, Neb. How long it will be before the road will be taken off the air and placed on the ground is not stated.

**Oregon Pacific.**—Construction work has been materially advanced of late on this road, owing to the fine weather. By Jan. 1 the road will be in operation to North Santiam River. Work will cease there for the winter.

**Pennsylvania.**—The application for a writ of certiorari to review the proceedings of the Board of Public Works of Jersey City in granting permission to this company to elevate its tracks in that city, has been denied by the Supreme Court of the state.

**Peoria & Michigan.**—Articles of incorporation filed in Illinois. The proposed road will extend from Peoria northeasterly through the counties of Peoria, Marshall, Putnam, Bureau, Lee, De Kalb, La Salle, Boone, and McHenry, to the state line dividing the county of McHenry, in Illinois, from the county of Walworth, in Wisconsin. Capital stock, \$3,000,000. Principal office at Chicago.

**Pittsburgh, Cleveland & Toledo.**—An order has been issued to sell this road, subject to a mortgage for \$2,500,000 held by the Central Trust Co., of New York. The road, which forms a part of the Pittsburgh & Western, extends from New Castle Junction, Pa., to Valley Junction (Akron), O., 77 miles.

**Pueblo & San Luis Valley.**—This company is being organized in Pueblo, Col., for the purpose of building another road south from Pueblo into the San Luis Valley.

**Red River Valley.**—All hope of any further work on this Manitoba road until after a session of the Legislature has been abandoned. The Citizens' Committee of Winnipeg have passed a resolution not to hand over the \$300,000 donated by the city.

**Richmond & Danville Dispatch.**—This is the name of the new all rail fast freight line between New York and southern points, via Baltimore and Washington, over the Pennsylvania and Richmond & Danville systems.

**Rochester & Glen Haven.**—This company has been formed in Rochester, N. Y., for the purpose of building a road from that city to Lake's Point on Irondequoit Bay, 3½ miles. A summer hotel will be built at the bay terminus. Capital stock of the company, \$200,000.

**St. Louis, Alton & Terre Haute.**—N. W. Irish, of Carlisle, Ill., has the contract for grading the Cairo Short Line.

**San Antonio & Aransas Pass.**—In building to Natchez, Miss., the extension of this road is completed from Kennedy Junction, Tex., to Wallace, 156 miles; from there to Houston the line is already located. The present objective point is Alexandria, La., 185 miles from Wallace.

**South Carolina.**—Bills have been introduced in the Legislature to incorporate the East Shore Railway & Terminal Co., and the Wilson & Summerton Railroad Co.

**Southern Pacific.**—The company will complete its line from the Eagle Pass on the Rio Grande River to a connection with the Mexican Central early next month.

**Southern Railway Construction & Improvement Co.**—This company has been incorporated in Chicago for the purpose of constructing and equipping railroads. Capital stock, \$120,000.

**Stockton & Tulare.**—Articles of incorporation filed in California for the purpose of building a standard gauge road from Oakdale, Stanislaus County, to Poso, Kern County, 200 miles. Several branches are also projected as follows: From Modesto east to the main line, about 16 miles; from Merced east to the main line, about 10 miles; from Sycamore, Fresno County, in an easterly direction to a connection with the main line; from Fresno 10 miles east to the main line, and from Tulare, 16 miles east to the main line. The estimated length of the road and its branches is about 262 miles. The capital stock is placed at \$7,860,000.

**Toledo, Saginaw & Muskegon.**—The road was completed on Dec. 7. It is 96 miles long, extending from Muskegon, Mich., to Ashley, on the Toledo, Ann Arbor & North Michigan. The two roads have a traffic contract.

**Union Pacific.**—On Dec. 4 through sleeping cars were put on between Council Bluffs, Ia., and San Francisco, Los Angeles and other California points, and also between Kansas City and Ogden, Utah.

**Western New York & Pennsylvania.**—The new mortgages of this company, formerly the Buffalo, New York & Philadelphia, have been placed in the hands of President G. Clinton Gardner. The first mortgage is made to the Mercantile Trust Co., of New York, and is for \$10,000,000, of which amount \$2,500,000 in bonds will be retained in the treasury of the road to meet future obligations. The Fidelity Trust & Safe Deposit Co., of this city, is made the second mortgagee as trustee. This mortgage is for \$20,000,000.

**Wheeling, Wellsburg & State Line.**—At a meeting in Wellsburg, W. Va., last week, the sum of \$5,000 per mile and right of way for the proposed road was pledged the company. By the first of April or May the company expects to be ready to consider propositions from contractors.

**Wichita, Richfield & Trinidad.**—This company, with headquarters in Richfield, Kan., has been organized and a charter applied for.

**Wilmington & Weldon.**—A. H. Smith, of Scotland Neck, N. C., has the contract for 8 miles of the Scotland Neck extension. When the surveys are finished 15 miles more will be put under contract.

## TRAFFIC AND EARNINGS.

### Traffic Notes.

Local half-fare tickets on the roads of the Central Traffic Association for Christmas and New Years will this season be good on Dec. 24, 25, 26 and 31, and Jan. 1, 2 and 3.

It is reported that an exclusive traffic agreement will be made between the Kansas Division of the Union Pacific and the Kansas City line of the Chicago, Milwaukee & St. Paul, which has just been completed.

Press dispatches from Northern and Western Minnesota and Dakota state that coal is very scarce in all that region, and give as the reason that population has increased faster than the means of supply, and that the railroads are unable to furnish cars.

## Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of November:	1887.	1886.	Inc. or Dec.	P. c.
Buff. R. & P.	108,445	130,015	I.	25,830 20.6
Cairo, V. & Chi.	64,741	63,092	I.	1,649 2.6
C. I. St. L. & C.	217,134	208,429	I.	8,705 4.1
Lake Erie & W.	171,358	137,462	I.	33,896 24.6
Mil. & Northern	89,680	67,149	I.	22,531 32.5
Northern Pac.	1,602,449	1,229,906	I.	372,543 30.3
T. A. A. & N. M.	52,874	42,842	I.	10,032 23.4

Month of October:	1887.	1886.	Inc. or Dec.	P. c.
Allegheny Val.	\$192,679	\$173,598	I.	\$19,081 10.9
Net	9,037	78,075	I.	13,962 17.8
Balt. & Potomac	133,628	130,694	I.	2,930 2.2
Net	60,901	60,576	D.	325 0.5
Buff. N. Y. & P.	260,053	229,221	I.	30,832 13.4
Net	39,892	31,079	I.	8,813 28.4
Cam. & Atl. & Bras.	37,520	37,948	I.	428 1.2
Net	def. 3,579	4,320	D.	740 1.9
Canadian Pac.	1,263,996	1,077,630	I.	186,366 17.3
Net	467,940	467,940	I.	0 0.0
Carolina Central	6,113	63,108	D.	57,000 9.3
Net	35,101	36,215	D.	1,114 3.1
Chi. B. & I.	2,774,923	2,770,774	D.	4,149 0.1
Net	1,222,602	1,568,944	I.	346,282 28.2
Chi. St. L. & P.	545,356	465,637	I.	79,719 17.1
Net	130,590	111,884	I.	18,706 16.7
Cl. C. & I.	454,238	408,683	I.	45,555 11.1
Net	200,713	173,780	I.	26,933 15.5
Den. & B. G. W.	137,715	112,687	I.	25,028 22.2
Net	56,738	50,418	I.	6,320 12.5
Det. B. C. & A.	38,201	28,002	I.	10,199 36.4
Net	11,792	15,419	D.	3,627 30.5
Gr. Rapids & Ind.	275,242	241,523	I.	33,719 14.0
Net	95,746	87,313	I.	8,433 9.6
Gr. B. W. & St. P.	37,489	39,343	D.	1,854 4.9
Net	26,483	26,187	D.	296 1.1
Kentucky Cent.	104,797	92,361	I.	12,436 13.4
Net	45,512	39,852	I.	5,660 14.1
Louisv. & Nashv.	1,378,706	1,379,828	I.	1,122 0.0
Net	628,031	584,084	I.	44,947 7.0
Memphis & Chas.	178,549	160,909	I.	17,640 10.9
Net	68,908	82,098	D.	13,190 1.6
N. Y. L. E. & W.	2,550,008	2,440,704	I.	109,304 4.4
Net	781,105	777,813	I.	3,292 0.4
N. Y. Ont. & W.	145,356	130,004	I.	15,352 11.8
Net	30,271	20,433	I.	9,838 48.2
Norfolk & West.	433,852	334,713	I.	99,139 29.3
Net	200,266	147,460	I.	52,806 35.7
Northern Central	501,294	516,825	D.	15,531 3.0
Net	50,391	100,864	D.	134,473 70.4
Northern Pacific	1,671,040	1,443,667	I.	227,373 15.8
Net	963,150	874,600	I.	88,550 10.1
Ohio & Miss.	413,437	367,747	I.	45,690 12.3
Net	176,664	130,817	I.	45,847 34.3
Oreg. R. & N. Co.	615,046	633,340	D.	18,294 3.0
Net	390,607	367,562	D.	23,045 5.7
Pa. E. of P. & E.	4,980,518	4,737,748	I.	242,770 5.1
Net	1,719,987	1,859,746	D.	139,759 7.5
Phila. & Erie	368,619	371,521	D.	2,902 0.7
Net	153,634	160,373	D.	6,739 4.4
Phila. & Read	2,087,591	1,981,576	I.	106,015 5.3
Net	1,108,541	870,413	I.	238,128 27.3
P. & R. C. & I. Co.	2,321,205	1,735,217	I.	585,988 33.7
Net	233,493	def. 78,528	I.	312,021 39.9
To all both Co.'s	4,406,296	3,696,894	I.	710,402 19.2
Net	1,342,035	800,875	I.	541,160 68.5
Sab'd & Roan.	77,166	72,932	I.	4,234 5.4
Net	41,445	41,380	D.	65 0.1
Shenandoah Val.	98,043	81,954	I.	16,089 19.6
Net	16,656	20,102	D.	3,446 17.1
Union Pacific	2,934,465	2,755,134	I.	179,331 6.5
Net	1,561,020	1,265,890	I.	295,130 23.3
West J. and Brs.	104,208	96,596	I.	7,612 7.8
Net	27,580	30,596	D.	12,016 30.3

Month of September:	1887.	1886.	Inc. or Dec.	P. c.
Central Pacific	1,340,854	1,146,367	I.	194,487 16.9
Net	614,461	614,461	I.	0 0.0
Ev. & Terre H.	80,750	63,963	I.	16,787 26.2
Net	42,501	30,009	I.	12,492 41.6
Peoria, Dec. & E.	78,402	90,481	D.	12,079 13.3
Net	35,095	53,912	D.	18,817 52.8
South. P. R. R. Co.	157,040	184,431	D.	27,391 14.8
Net	70,798	104,460	D.	33,662 47.3
So. Div. (Cal.)	256,059	318,421	D.	62,362 19.5
Net	29,783	123,735	D.	93,952 31.9
New Mex. Div.	55,732	49,201	I.	6,531 13.2
Net	25,280	20,526	I.	4,754 23.1
Ariz. Div.	122,173	113,183	I.	8,990 7.9
Net	36,149	37,490	D.	1,340 3.6

Nine months—Jan. 1 to Sept. 30:	1887.	1886.	Inc. or Dec.	P. c.
Buff. N. Y. & P.	2,085,526	1,942,300	I.	143,226 7.3
Net	444,806	372,626	I.	72,180 19.5
Bar. C. R. & No.	2,081,330	2,019,636	I.	61,694 3.0
Net	433,931	460,017	D.	26,086 6.0
Chi. Mil. & St. P.	17,407,478	17,300,772	I.	106,706 0.6
Net	6,139,398	6,386,838	D.	247,440 3.9
Wheeling & L. E.	544,295	429,368	I.	114,927 27.8
Net	156,843	92,404	I.	64,439 69.7

Ten months—Jan. 1 to Oct. 31:	1887.	1886.	Inc. or Dec.	P. c.
Chi. B. & I.	23,655,856	22,103,637	I.	1,552,219 7.0
Net	10,276,837	10,704,019	D.	427,182 4.1
Chi. St. L. & P.	4,775,684	3,936,989	I.	838,695 21.1
Net	1,248,010	646,986	I.	601,024 92.8
North. Central	5,180,483	4,523,658	I.	656,825 14.5
Net	1,781,496	1,570,519	I.	210,977 13.4
Pa. (E. of P. & E.)	46,043,197	41,603,625	I.	4,439,572 10.6
Net	15,846,645	14,834,581	I.	1,012,064 6.8
Phila. & Read	18,089,392	16,156,017	I.	1,933,375 11.9
Net	9,414,693	6,536,457	I.	2,878,236 44.2
Phil. & R. C. & I.	15,800,486	12,613,692	I.	3,186,794 25.3
Net	1,096,989	def. 1,756,160	I.	2,853,149 160.1
Total both Co.'s	33,940,808	28,729,700	I.	5,211,108 18.1
Net	10,511,079	4,797,297	I.	5,713,782 119.1



### The Inter-state Commerce Commission.

The commission last week decided the case of W. H. Council, colored, principal of the Huntsville (Ala.) industrial school, against the Western & Atlantic, alleging discrimination against himself and in favor of white passengers on the part of the company, in compelling him to ride in a second class car when he had a first class ticket. Mr. Council took his seat in the women's car, the only passenger car on the train except a half car, indifferently filled up, for colored people. Into the latter Mr. Council was directed to go, but did not go until forced to do so. He was treated with some violence, which the railroad claims was at the hands of passengers and not employees. The road answered that it gave Council equally good accommodations, and that it had a right to separate its white and colored passengers. The opinion is by Mr. Morrison, Commissioner, and the Commission decides: That it will not go into the question of money damages because it cannot give a jury trial, which the defendant is entitled to have under the seventh amendment to the United States constitution, and that it is not authorized to award counsel and attorney's fees, which a court may do under the eighth section of the act to regulate commerce. That colored people may be assigned separate cars on equal terms, with out advantage to either race, and with increased comfort to both. That the complainant had paid the same fare as other first-class passengers, and it was only fair dealing and common honesty that he should have the security and convenience of travel for which his money had been taken. That the car furnished was only second-class in comforts for travel and the road must furnish colored people, who buy first-class tickets, accommodations equally safe and comfortable with other first-class passengers.

In the case of W. O. Harwell and others, against the Columbus & Western and the Western of Alabama, the Commission finds that Opelika is discriminated against in favor of Columbus and Montgomery. The reasons claimed to justify this are considered and found insufficient; but no order is made, for the reason that other localities should be heard before final decision; the roads are, however, told that their tariffs need revision.

In the case of Evans and Reed against the Oregon Railway & Navigation Co., the Commission decides, after a lengthy discussion of the tariffs, earnings and expenses of the company, that 30 cents per 100 lbs. on wheat from Walla Walla to Portland is too high, and that on and after Dec. 15, the company must not charge more than 23 1/2 cents.

### Western Railway Inspection Bureau.

This Association, which began operations Dec. 1, includes all the prominent roads in the territory which includes the undermentioned places, and its purposes are indicated by the following extracts from the rules:

The purpose of the Association is to provide for the inspection of all freight in car-load lots or less, passing through competitive points.

The territory to be covered by this organization will be all freight, local or competitive, originating at, passing through, or destined to, Chicago, Englewood, South Chicago, Auburn, Washington Heights, Blue Island, Joliet, Seneca, Beardstown, Milwaukee, Racine, Appleton, Kaukauna, Neenah, Menasha, Oshkosh, St. Louis, East St. Louis, Kansas City, Leavenworth, Atchison, St. Joseph, Union Pacific Transfer, Council Bluffs, Omaha, Lincoln, Missouri Valley, Sioux City, Des Moines, St. Paul, Minneapolis, Minnesota Transfer, and any other points which may from time to time be agreed upon by all lines interested, it being the intention to inspect at above points all freight regardless of origin or destination.

An executive committee of seven is provided for; also a superintendent, who must be elected by unanimous vote of the members of the Association.

The duties of the inspectors will be to examine all freight for shipment; to carefully examine packages which they may think contain articles which are not mentioned on the tally-slip furnished by shippers, or on transfer bills from foreign roads, and when such packages are opened to carefully note on the shipping ticket the contents of such packages and the proper classification, and to carefully repack all articles examined so as not to cause any complaint for loss or damage by reason of such examination.

The heads of the several freight departments shall instruct their agent at stations where inspection is provided for to cooperate in every way possible with the inspector.

The superintendent shall have access to the books of each station to check the reports of the inspection against the billing of said freight, to see whether the inspection has been properly protected; and in all cases where it is not protected he shall refer same to the General Freight Department, and in case the failure to properly protect the inspection is continued by any line, then it shall be the duty of the superintendent to call the attention of the other members of the Association to such delinquency, and on request of any two or more members the Chairman of the Executive Committee may call a meeting to discuss the matter in all its bearings.

The expenses of the Association shall be borne by the several roads in the following manner: The salaries of all inspectors employed solely by one road shall be chargeable entirely to that road, but where one inspector does the service at more than one depot a division of his salary shall be made by the Superintendent in his discretion. All other expenses of the Association to be assessed against each line in proportion to the increase of revenue shown by the inspection service, and, in order to provide against delays in the payment of salaries of employees, waiting the proper return of reports from the numerous stations at which inspection service is performed, the assessment for all expenses other than the salaries of inspectors shall be made upon the basis of the increased revenue of the month preceding the one for which the assessment is made. Thirty days' notice must be given by any company wishing to withdraw from the Association.

### Minnesota Passenger Rates.

The Minnesota Railroad Commissioners on Dec. 2 issued a final notice, confirming their order of Nov. 10, which required the Northern Pacific and the St. Paul, Minneapolis & Manitoba to reduce their passenger fares to a uniform rate of 3 cents per mile. It was given out that the roads would ignore the order, on the ground that they were not subject to state jurisdiction, but they have made no response to the Board nor any appeal to the courts. The Board rehearses the facts and the cause for issuing the original order, and concludes as follows: "These rates shall be considered the legal, equal and reasonable maximum rates of fare to be charged within the state of Minnesota, and the same are now in force, and your schedule of rates and fares for the transportation of passengers are changed accordingly."

### Transcontinental Traffic Association.

Negotiations between the various roads interested in the transcontinental traffic during the past few weeks have resulted in the organization of an association under the above name. The headquarters will be at Denver, and J. S. Leeds, now General Freight Agent of the Atchison, Topeka & Santa Fe, will be chairman. It is said that the subsidy of \$65,000 to the Pacific Mail Steamship Co., which it has been agreed to pay, will be arranged in some indirect way in order to avoid conflict with the interstate law. The reports say that the first-class freight rate from New York to San Francisco will be advanced to \$4 per 100 lbs., and the other classes in proportion, and that the Canadian Pacific will be allowed to

make a differential of 30 cents on first-class, making the rate by that road \$3.70, and other classes in proportion. All lines will establish a first-class unlimited fare of \$60 and second class, or emigrant, \$35. First-class round trip excursion tickets, good for six months, will be advanced on Jan. 1 to \$80, and will be available on all days and on all trains. The commission on first-class tickets is placed at \$3.

### The Pennsylvania Charged With Unjust Discrimination.

The papers are being prepared in a suit to be brought by Holdship & Irwin, oil refiners in Pittsburgh, Pa., against the Pennsylvania road for \$114,000. Holdship & Irwin will allege that certain oil shippers over the Pennsylvania lines were granted a rebate of 10 cents per barrel on shipments made during the years 1884, 1885 and 1886. They, therefore, sue to recover the sum of 10 cents per barrel overcharges for freight. This rebate on the amount of oil they shipped during the three years mentioned would amount to \$38,000. Under the act of the General Assembly of 1883, a claim of three times the amount of damages sustained by any persons from unjust discrimination from railroad companies in the matter of freight. This makes the oil firm's claim amount to \$114,000, and interest from the beginning of 1884 until the present time will swell this sum still larger. Seven or eight other large oil refining firms are involved in the question to be raised, and the outcome of this suit may bring on others.

### Cutting Western Rates.

It is stated that Chicago and St. Louis rates on the Wabash will be reduced on Dec. 15 from 53 to 40 cents on first class and in proportion on the other classes. The Chicago, Burlington & Quincy will probably do the same. The freight agents of the Iowa roads met in Chicago on Dec. 7 and agreed on the following rates from Chicago to Mississippi River points, the distance tariffs to be made up on this basis:

Classes.	New rates.	Old rates.
	Cent.	Cent.
First.....	75	90
Second.....	60	70
Third.....	40	50
Fourth.....	30	35
Fifth.....	25	30
"A".....	30	32 1/2
"B".....	25	27 1/2
"C".....	20	22 1/2
"D".....	17 1/2	20
"E".....	15	16

The usual differentials will apply to the St. Louis and Omaha business.

### Closing of the New York State Canals.

At midnight on Dec. 1 the canals of New York state were officially closed. The season was two weeks shorter than that of last year, still the aggregate tonnage is greater by 200,000 tons, being 5,450,000 tons.

## ANNUAL REPORTS.

### Oregon Railway & Navigation Co.

The rail and water lines in operation by this company at the close of the fiscal year ending June 30 last were as follows:

Ocean Division (steamer line, Portland to San Francisco).....	670.0
Puget Sound Division.....	223.0
River Division.....	274.0

Total water lines.....1,167.0

Railroad Division:	
Portland to Riparia.....	301.0
Patoka Junction to Pomeroy.....	29.5
Bolles Junction to Dayton.....	13.0
Walla Walla to Pendleton.....	47.0
Umatilla to Huntington.....	217.8
Palouse Junction to Moscow.....	116.6
Colfax to Farmington.....	27.2

Total mileage.....1,919.1

The average mileage of railroad operated was 740, against 686 last year, and the average mileage on all divisions, including water lines, was 1,907, against 1,836 the previous year.

At the close of the year the equipment consisted of 74 locomotives, 35 passenger, 14 baggage, mail and express, and 1,800 freight cars; \$108,854 was expended for equipment during the six months ending Dec. 31, 1886.

The general balance sheet was as follows:

Construction and equipment.....	\$33,125,960
Investments.....	5,613,488
Cash and bills receivable.....	344,176
Trust funds.....	416,732
Accounts receivable.....	3,521,117
Oregon Short Line Ry., lessee.....	32,884
Suspended accounts.....	40,418
Supplies in hands of lessees.....	421,218

Total.....\$43,845,963

Liabilities:	
Capital stock.....	24,000,000
Bonded debt and debenture bonds.....	14,025,000
Bills payable.....	3,563,067
Interest.....	196,690
Miscellaneous.....	707,450
Surplus accounts.....	1,353,586

Total.....\$43,845,963

The earnings for the year, including all divisions operated by the company, both rail and water, were as follows:

	1887.	1886.	Inc or Dec.	P. c.
Freight.....	\$3,781,882	\$4,072,387	D.	285.5 7.0
Passenger.....	1,189,551	1,193,643	I.	105.908 0.8
Mail and express.....	215,370	251,595	D.	36.225 12.3
Miscellaneous.....	92,786	128,917	D.	36.131 28.0

Total.....\$5,294,530

Operating expenses.....\$5,546,542

Net earnings.....\$2,329,930

Gross earn. per mile.....\$254.489

Net " ".....1,322

Exp. to earn.....53.8

The income account was as follows:

Net earnings, six months to Dec. 31.....\$1,229,386

Rental, Jan. 1 to June 30.....1,192,653

Miscellaneous receipts.....27,635

Balance to profit and loss.....67,259

Total.....\$2,506,933

Interest.....\$829,058

Sinking fund.....86,910

Betterments.....40,965

Dividends (6 1/2 per cent.).....1,560,600

Total.....\$2,506,933

The expenses were divided as follows:

Conducting transportation.....\$1,067,611

Motive power.....862,719

Maintenance of way.....573,022

Main. of cars and steamers.....234,074

General expenses.....227,494

Total.....\$2,964,920

This includes the expenses of operating both the railroad and steamboat lines of the company.

The traffic was as follows:

	1887.	1886.	Inc. or Dec.	P. c.
No. pass. carried.....	334,798	300,918	I.	33,870 11.2
No. pass. carried one mile.....	40,655,847	37,537,293	I.	3,118,554 8.2
Tons freight carried.....	884,117	918,755	D.	34,638 3.7
Tons freight carried one mile.....	237,325,730	262,560,347	D.	25,134,617 9.5
Aves. miles per pass.....	121.4	124.7	D.	3.3
Aves. miles per ton freight.....	268.4	285.8	D.	17.4
Earn. per pass.....	3.58	3.63	D.	.05
Earn. per pass. per mile.....	.0295	.0291	I.	.0004
Earn. per ton freight.....	4.28	4.43	D.	.15
Earn. per ton freight per mile.....	.0159	.0155	I.	.0004

The earnings of the different divisions were as follows:

	Earnings.	Expenses.	Net earnings.	P. c.
Railroad division.....	\$3,781,877	\$1,830,869	\$1,928,008	48.7
Columbia & Palouse division.....	222,815	111,950	110,865	50.2
Ocean division.....	728,183	477,502	250,681	65.6
River division.....	401,085	388,446	12,639	96.8
Puget Sound div.....	183,599	156,154	27,445	85.0
Total.....	\$5,294,550	\$2,964,920	\$2,329,630	55.9

### Earnings and Expenses per Mile:

	Earnings.	Expenses.	Net earnings.	P. c.
Railroad division.....	\$6.214	\$3.041	\$3.203	48.7
Columbia & Palouse.....	1.614	.811	.803	50.2

The train and car mileage on the railroad division was as follows:

	1887.	1886.	Inc. or Dec.	P. c.
Passenger train miles.....	385,283	376,793	I.	8.490
Freight " ".....	728,183	774,816	D.	6.622
Passenger car miles.....	2,675,557	2,581,344	I.	94.213
Freight " ".....	15,222,288	15,976,906	D.	754.618

### Average:

	1887.	1886.	Inc. or Dec.	P. c.
No. pass. per train.....	52.5	47.6	I.	4.9
Tons freight per train.....	62.6	62.5	D.	.1
Miles per pass. train.....	119.4	119.8	D.	.4
" " freight " ".....	78.9	79.1	D.	.2
Earn. pass. train.....	\$267.98	\$250.75	I.	17.23
" freight " ".....	295.96	313.29	D.	17.33
" pass. train mile.....	2.24	2.09	I.	.15
" freight " ".....	3.73	3.96	D.	.23

The average train was 7.83 passenger cars, against 7.51 last year, and 20.85 freight against 21.73.

There was expended for construction during the six months ending Dec. 31, 1886 (prior to the lease to the Oregon Short Line), \$108,915, less \$14,255 received from the sale of various fixtures, leaving an increase of \$94,672 to the construction account; on the Columbia & Palouse road and branches, there was expended for construction and equipment during the same period \$222,026.

The decrease in the earnings is partly due to the light wheat crop, in comparison with previous years; a large amount of land was left to summer fallow in 1886, and the new land put into cultivation, though large, was not enough to offset the acreage left to rest. This resulted in a decrease of about 100,000 tons in the wheat tonnage, which would mean a loss in the gross revenue of about \$600,000. But as the decrease is but about \$166,000, it shows a growth in general business of about \$434,000. As a result of last year's summer fallowing of the land, the acreage and yield of the corn and wheat crop has largely increased, being estimated at about 350,000 tons, or nearly 30 per cent. more than the heaviest year before. A reduction of the wheat rate from \$6 to \$5 per ton was made soon after the close of the year, covering a large portion of the wheat country tributary to the company in Eastern Oregon and Washington Territory, but it is expected that the growth of general business from the marketing of the large wheat crop will enable the company to increase its earnings, notwithstanding the reduction.

The cultivation of small fruit in the Walla Walla Valley has grown very rapidly, and shipments of large quantities are made as far East as St. Paul and Omaha. The deliveries of lumber to the Northern and Union Pacific companies has amounted to over 2,000 car loads. The rates are low, but many cars that heretofore have returned empty now return loaded.

The competition of the Oregon & California road between Portland and San Francisco has caused a loss in first-class passenger business on the Ocean Division, and its opening will cause a further loss. The company believes, however, that it can retain the bulk of the freight and lower passenger traffic between California and Oregon.

The rail line has absorbed nearly all the traffic of the River Division, and it now simply serves as a feeder to the rail lines.

The Puget Sound Division has suffered from the loss of the contract for carrying the United States mails, and by competition lasting during the whole of the year.

The branch of the Columbia & Palouse, from Colfax to Farmington, 27.2 miles, was completed, and the gap between Blue Mountain and Centerville, 10 miles, was built. No road is under construction at present, but several engineering parties are engaged in preliminary surveys for projected branches, some of which, it is expected, will be built this year.

On the 25th day of April, 1887, a lease of the property of the company to the Oregon Short Line was executed, the lease to take effect as of Jan. 1, 1887. The transactions of this year, therefore, cover the operation of the property to Dec. 31, 1886, and the collection and distribution of the rental from Jan. 1, 1887, to June 30, 1887. There are still some matters of detail unadjusted, but they will not materially affect the results as now given.

The lease is for a period of 99 years, and was made under a guarantee from the Union Pacific of all obligations of the Oregon Short Line. All the property of the company is turned over (excepting cash and accounts and various pieces of real estate), including the ocean steamers, river and sound boats, and all their appurtenances, branch lines, contracts and privileges. The rental is to be an amount equal to the amount of interest payable semi-annually on all first mortgage bonds outstanding and uncalled, as provided in the first mortgage; \$60,000 per annum for sinking fund, as provided under the first mortgage, and the interest on all bonds purchased and cancelled by the sinking fund; the amount of interest payable semi-annually on all consolidated mortgage bonds outstanding or to be issued as provided in the lease; \$1,440,000 payable quarterly, being 6 per cent. on the amount of the capital stock; the interest on debenture bonds outstanding; a sum not exceeding \$15,000 per annum for organization expenses; such amounts as may become due and payable by this company by reason of any contract or agreement (not including any obligations in connection with the Oregonian Railway Co. and the Oregon Steam Navigation Co., stockholders); an amount equal to the interest on any bonds which shall, during the existence of the lease, be issued to take up, pay or retire the consolidated bonds, or issued to take up, pay or retire any subsequent issue of bonds.